September 2, 1946

# STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 59

HNOLOGY DEPT!

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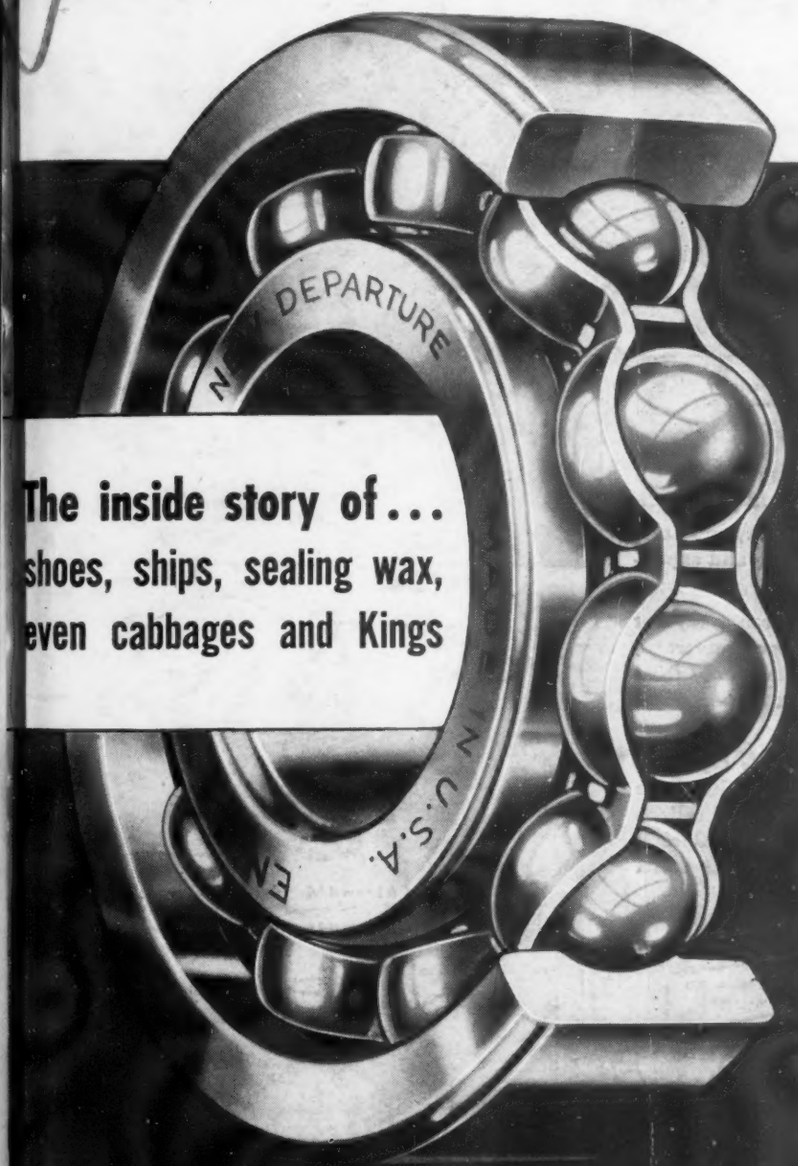



**The inside story of...**
**shoes, ships, sealing wax, even cabbages and Kings**

Rugged New Departure Ball Bearings carry huge loads on tough steel balls.

Almost everything used to do a job better, lessen labor, or make life roll more smoothly, has ball bearings in its system—or in its family tree.

For nothing rolls like a ball—and the *ball* bearing is uniquely fit for the higher speeds, heavier loads and greater precision of modern industry.

New Departure is deservedly the world's greatest ball bearing maker. Its practical experience is unequalled. Its thinking is forward-looking.

New Departure is proud that so many makers of better machines and appliances can say: "It rolls on New Departure Ball Bearings!"

3427-R1

*nothing rolls like a ball*

**NEW DEPARTURE**

**BALL BEARINGS**

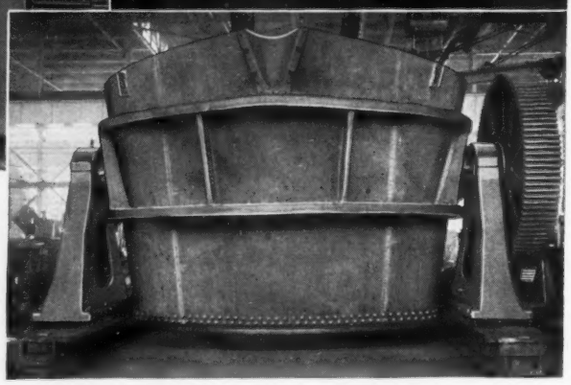
NEW DEPARTURE • Division of General Motors • BRISTOL, CONN. • Branches in DETROIT • CHICAGO • and other Principal Cities

R v. 119 2 Sept - Oct. 1946

# FOR *HOT* METAL APPLICATIONS

# EC&M CONTROL *offers* MANY ADVANTAGES

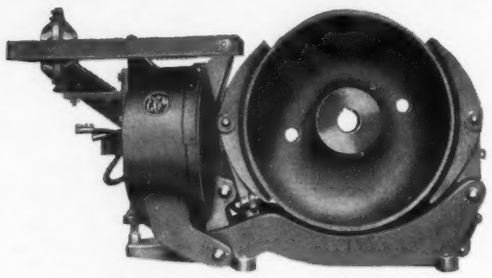
● 175-Ton Hot Metal Holding Ladle built by Treadwell Construction Co., Midland, Pa.



★ Wherever hot metal is stored, handled or processed, many firms, acquainted with EC&M value, select this quality apparatus because of their confidence in it—in the engineering and experience which it represents.

Typical hot metal applications include: (1) Ladle Cranes, (2) Hot Metal Cranes, (3) Hot Metal Mixers, (4) Bessemer Converters, (5) Storage Vessels, (6) Blast Furnace Guns—where only tried and true equipment which represents the utmost in safety and dependability is acceptable.

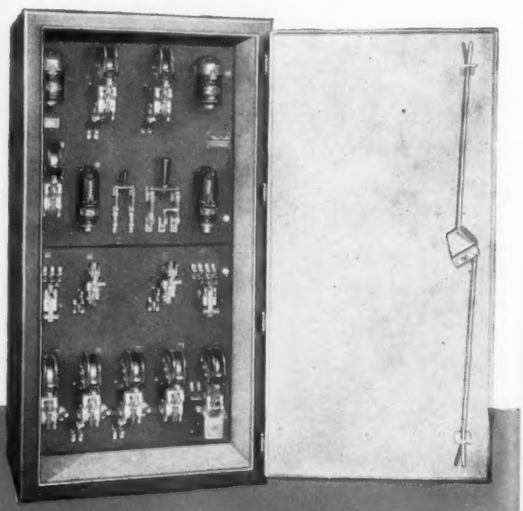
Listed at the left are a few of the EC&M products especially designed for the requirements of hot metal service. They have proved themselves highly successful in many applications throughout the years. Specify EC&M Control for hot metal applications.



● EC&M Air and Magnetically-operated Type WB Brake—normally operated by motor current with air-release for emergency operation.

**EC&M EQUIPMENT**
**Especially Designed for Hot Metal Service**

1. EC&M Converter Control System (Patent No. 1,899,586)
2. Dead-Man's Master Switch
3. Air and Magnetically-released Brakes
4. Positive-type Limit Stops for Slowdown and Final Stopping
5. LINE-ARC Magnetic Contactor Controllers.



THE ELECTRIC CONTROLLER & MFG. CO.
2700 E. 79th ST. CLEVELAND, OHIO

# MORE SCRAP
# for Steel Mills
# MEANS MORE STEEL
# for You

To maintain and if possible expand the present rate of steel production, larger supplies of scrap must flow immediately to the mills.

We urge that you ship every available ton of iron and steel scrap *now*, and that you see that it moves as rapidly as possible toward a steel mill.

In that way you will accomplish these two things:

**1.** You will help to avert the threat of a scrap famine which would severely curtail the production of needed steel.

**2.** You will help the steel mills in their continuing effort to make more steel for yourself and other steel consumers.

BETHLEHEM STEEL COMPANY
*General Offices:* Bethlehem, Pa.

BETHLEHEM PACIFIC COAST STEEL CORPORATION
*General Offices:* San Francisco

★ BETHLEHEM STEEL ★

# THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS · SHEARS · BRAKES

## Paid for itself 4 times!

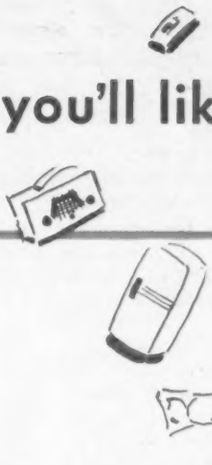
This Cincinnati Press Brake bending ends on hopper chutes in a railroad shop paid its cost four times in three years.

Cincinnati Press Brakes are versatile and busy machines, as the same machine will punch, bend, form or corrugate both ferrous and non-ferrous metals.

Modern in design, modern in performance, and modern in speed and accuracy, they are profitable tools.

Write for instructive brake catalog B-2. It illustrates many press brake applications.

# . . . a spring service you'll like



## long experience...
## in applying the right spring
## to assure top performance
## ...for your product

IN your effort to make a better product you naturally try to leave nothing to chance. We'd like to suggest that you don't leave the springs for your product to chance either. Take advantage of Accurate's long experience . . . be sure . . . by letting us help you choose the proper type and size spring, made from the material best suited to your conditions. Many, many times, proper spring selection has paid dividends by improving product performance and preventing product failure.

Accurate's business is to furnish precision springs and wire forms for a wide variety of products. In addition to our ability to help you with spring engineering, we have the expert personnel and modern equipment necessary to give you fast service and fine workmanship.

*Send for a copy of the Accurate Handbook on Springs.*

**ACCURATE SPRING MFG. COMPANY**
**3823 W. Lake Street, Chicago 24, Illinois**

*Springs* Accurate Springs *Wire Forms • Stampings*

# Behind the Scenes...

## Around The World In 90 Minutes

We wish you could have sat in with us a week or so ago when all the Penton employes gathered together to hear Earl Shaner review his recently completed 77-day trip around the world. Of course, we don't know anyone who can do a better job of informal story telling than Earl, and what a story he had to tell. For an hour and a half he took the linotypers, the stenographers, the pressmen, the editors, the advertising salesmen, the office boys, the circulation girls, and the mail room clerks around the world. We stayed at the Mitsui club in Tokyo, inspected the world's largest open pit coal mine in Manchuria, got caught in a typhoon in Formosa, ate octopus, birdnests and shark fins in China, roamed the streets of Calcutta, and buzzed the Taj Mahal. We thrilled to the beauty of Cairo and to the southern coast of France as we flew over the Mediterranean on a beautiful starlit night. We did Paris and went on to Berlin by the way of Frankfurt, making sure we stayed in the 10-mile corridor allowed American planes. We went on to Nürnberg, sat in on the trial and watched Goering try to clown, spent a beautiful evening up on a mountain overlooking Vienna, dropped in to chat with our London office manager, Vincent Delport, and then headed for home. We had breakfast in Iceland, flew past the barren, ice-packed coast of Greenland, through a forest fire as we headed over New Brunswick and finally taxied across the Washington airport, having travelled 48,500 miles in 247 flying hours. What a trip!

## Two-Pants Suits—Maybe

We understand you can now get yourself that extra pair of pants with the new suit you're going to buy, if you're lucky enough to find the suit in the first place. All you have to do is take Form number so-and-so and fill it out completely (probably with an original and two copies) and forward it on to Washington where they will give due consideration to your appeal that you wear out your trousers before you do your coat, and/or that you are somewhat on the portly side and that your pants take a better than average beating, and/or that you do a lot of driving and the seat of your trou get as shiny as a well polished billiard ball, and/or whatever else you can think of. In time (they say) you will get an approval back, which you then take to your tailor, only to find that he doesn't have another pair anyway.

All of that reminds us of a friend of ours here in town who bought himself a suit a few weeks ago and asked for another pair of trousers, but of course was turned down. "Why," says he, "am I the only guy in the United States—in the world as a matter of fact—who can't buy that other pair of pants?" And he was. Anyone else could have walked in and bought them but not our friend. Well, to shorten a long story, he got his dander up, spent two full days calling on CPA, OPA, XYZ, and PDQ, took about three years off his life expectancy, and finally pulled enough wires to get those other pants.

## Another Exclusive Coming Up

Look for a good story in the September 9 issue of STEEL on the current inventory position of metalworking plants. STEEL's editorial researchers have been at it again, digging into such things as duplicate orders, expected delivery dates on materials and equipment, the extent to which typical metalworking plants are in the market for various types of equipment, etc. etc.

## An Open Request

Speaking of STEEL's editorial research activities, we're getting set up to tackle about any kind of fact finding which is of interest to a sufficient percentage of the readers of the publication. If you, while giving it further thought, have some current problems of either a technical or general nature on which you feel we could be of some help, for gosh sakes call in your gal and write us about it. The chances are about 10 to 1, on the basis of past experience, that someone on the staff can come up with the jackpot answer or, if not, will know where to get it.

## We're Sorry We Done It

This isn't the first time that your favorite business paper has affected Wall Street, but several readers did call our attention to the UP new release which was carried on the financial pages of the newspapers August 19. "Steels", it read, "were hard hit following a prediction by the magazine STEEL that mill operations shortly will slump sharply because of scrap shortages". But don't misunderstand us, we'd much rather see those nasty old stocks turn right around and start a steady climb up the ladder, and as a matter of fact we're working on a little deal with our editors right now to see if they can't do something about it. If anything develops, we'll let you in on it, if you promise not to tell a soul.

Shirley

(Editorial Index—page 59)

STEEL

Vol. 119—No. 10 September 2, 1946

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Published by THE PENTON PUBLISHING Co., Penton Building, Cleveland 13, Ohio, E. L. SHANER, President and Treasurer; G. O. HAYS, Vice President and General Manager; R. C. JAENKE, Vice President; F. G. STEINEBACH, Vice President and Secretary; E. L. WERNER, Assistant Treasurer.

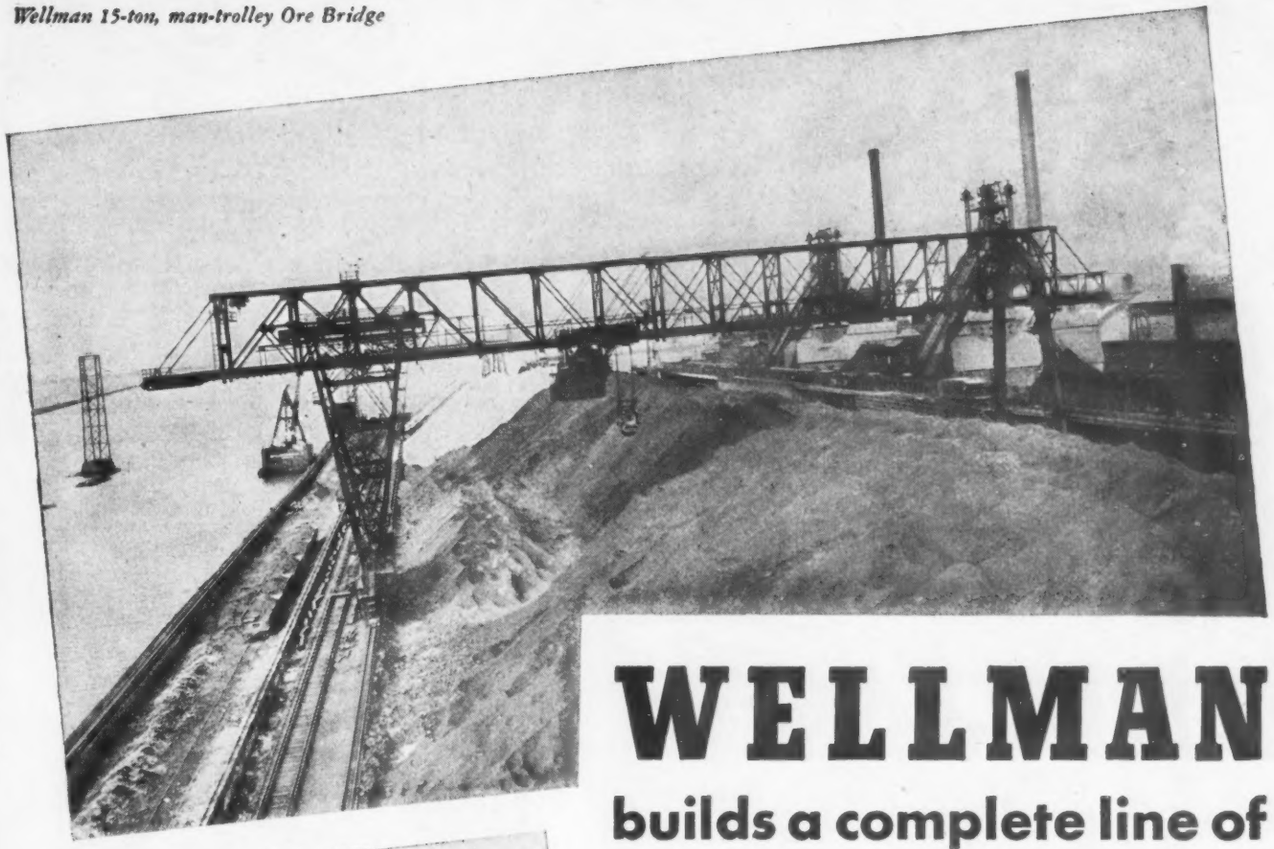
Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $6; two years $10; all other countries, one year $12. Single copies (current issues) 25c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1946 by the Penton Publishing Co.

*Editorial Staff on Contents Page*

ABC ABP

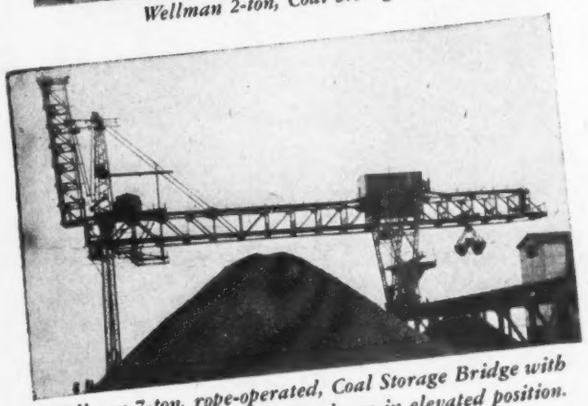
*Wellman 15-ton, man-trolley Ore Bridge*



# WELLMAN

## builds a complete line of ORE and COAL HANDLING BRIDGES

*Wellman 2-ton, Coal Storage Bridge*



*Wellman 7-ton, rope-operated, Coal Storage Bridge with folding boom in elevated position.*

The Wellman Engineering Company has a wealth of experience in building Ore and Coal Handling Bridges of many types and capacities.

★

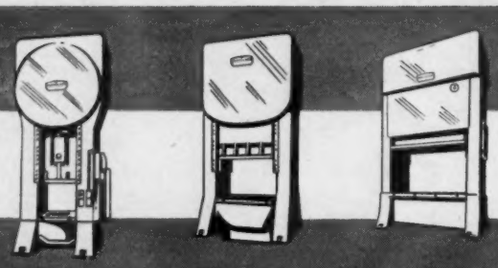
## WELLMAN WILL BUILD IT!

- Car Dumpers (all types)
- Ore and Coal Handling Bridges
- Gas Producers
- Skip Hoists
- Industrial Furnaces
- Coke Pushers
- Mine Hoists
- Charging Machines
- Soaking Pits

Special Cranes (Wharf, Dry-Dock, Hammerhead, Pontoon)

**THE WELLMAN ENGINEERING COMPANY**
**7029 CENTRAL AVENUE • CLEVELAND 4, OHIO**

# MODERN

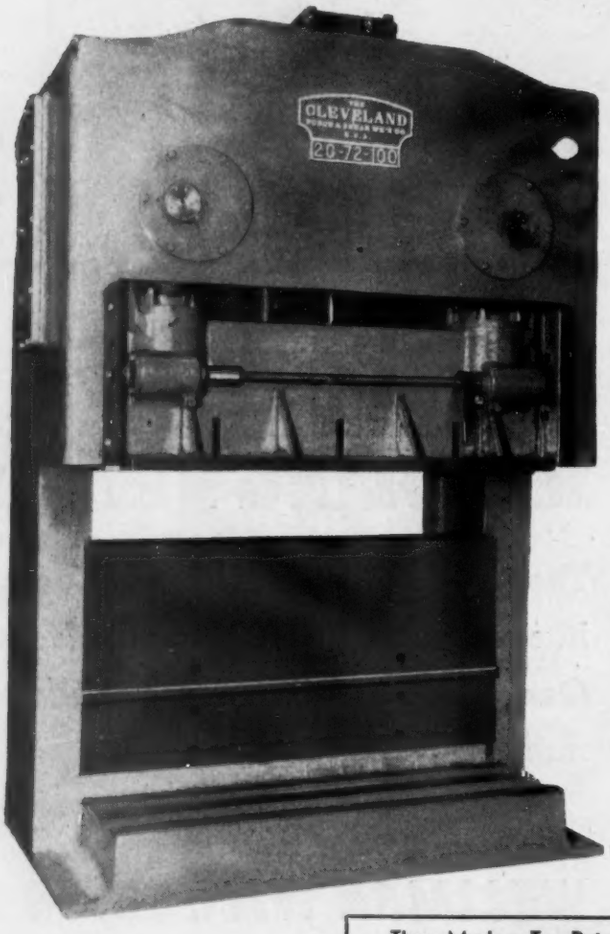


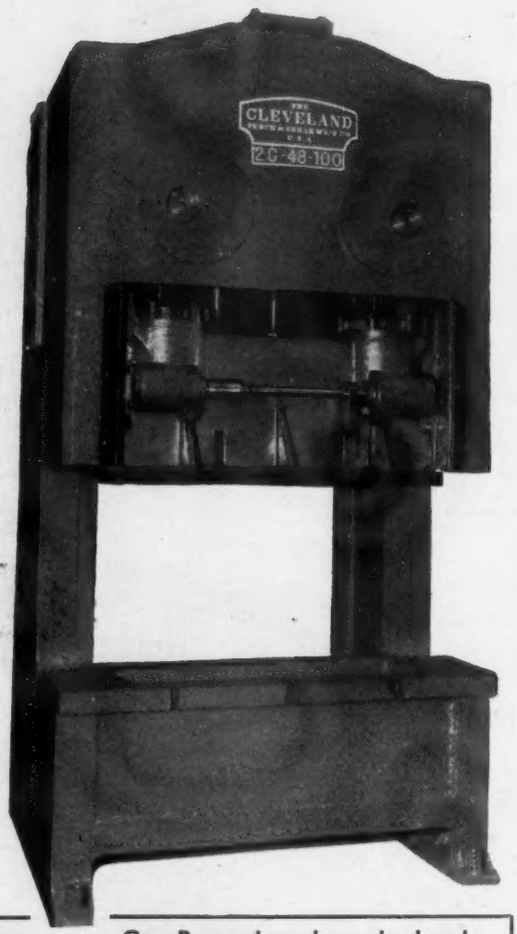
Straight-sided Presses

Single Point Two Point Four Point

*and NOW—*

# MODERN *Two Point* GAP *Presses!*




*If it's a*

CLEVELAND

*it's modern!*

These Modern Two Point Open Gap Presses have been developed along the lines of our Modern Straight Sided Presses, with the gears, flywheel and drive unit located in the box type crown.

This design not only eliminates all overhanging brackets and other projections but it also provides more ruggedness and greater accuracy to the machine, as well as saving valuable floor space.

The 2G-72-100 Press, which has the lower section of the bed cut back, has a stroke of 10", adjustment 4", capacity 100 tons and operates at 35 strokes per minute.

The 2G-48-100 Press has a stroke of 8", adjustment 4", shut height—24", capacity 100 tons and operates at 35 strokes per minute.

Both of these Modern Cleveland Presses are equipped with an electrically controlled hydraulically operated friction clutch but an air operated friction clutch can be furnished, if desired.

## THE CLEVELAND PUNCH & SHEAR WORKS COMPANY *Cleveland, O.*

*New York • Chicago • Detroit • Philadelphia • Pittsburgh*

# JESSOP

## *New Process*

## VEE-OGINIZED

## HIGH SPEED STEELS

Jessop Steel Company's VEE-OGINIZING process, an entirely new method of hot working high speed steel rounds in diameters greater than four inches, yields a more homogeneous cross sectional carbide distribution than is possible with conventional hot working methods. VEE-OGINIZING high speed steel prevents center rupture and assures uniformity in heat treating results. VEE-OGINIZED High Speed Steel will benefit you by savings in machining time, savings in machining costs, and savings in metal. Let Jessop's new process simplify your high speed steel problems. Write for detailed information.

These actual macro and inserted longitudinal microstructures of 7" round bars of 18-4-1 type Jessop Supremus High Speed Steel illustrate the outstanding differences between the conventional method of hot working and the new VEE-OGINIZING process. The bar on the left was processed by conventional methods; bar on the right produced by Jessop's VEE-OGINIZING process. Photographs reduced one-half.

JESSOP STEEL COMPANY

WASHINGTON, PA.

# Does your power contract contain a clause...

## like this?

POWER FACTOR BONUS—credit for power factor maintained at or above a predetermined value.

## ...or this?

KVA DEMAND RATE—power rate determined by the KVA demand.

## ...or this?

PENALTY FOR LOW POWER FACTOR—billing rate increased for power factor below a predetermined value.

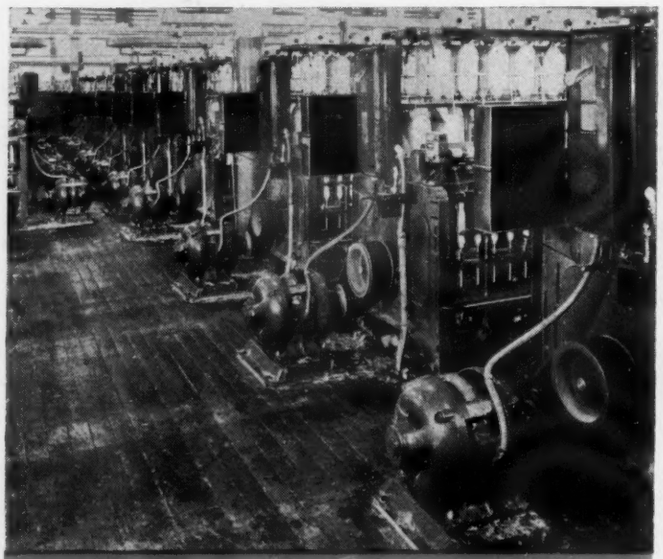
If your plant load is made up of inductive apparatus such as motors, welders and induction heating equipment . . . Westinghouse capacitors can probably reduce your power costs.

Apparatus such as this draws more current than is represented by the kilowatthour meter readings. Most utilities offer an inducement for removing this current from their circuits.

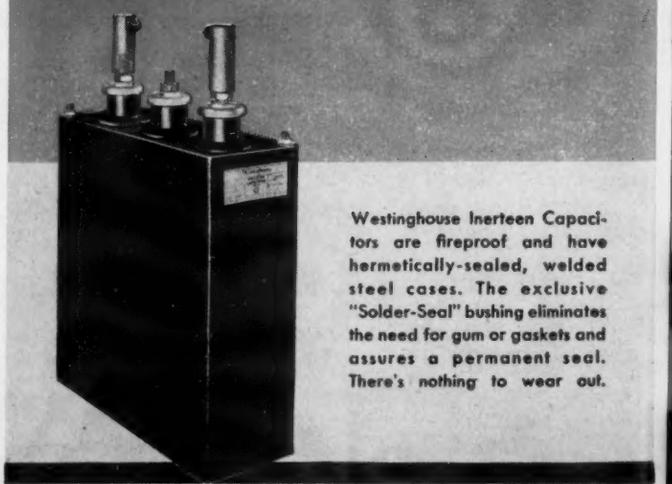
"Billing savings" is just one of the benefits to be gained from capacitors. Better voltage regulation, brighter lights, better motor starting and running performance . . . all result from the use of capacitors. In many cases capacitors will release capacity of your electrical system for added load.

Capacitors offer predictable dollar-and-cents savings. On the average, each kvar will save from $18.00 to $35.00 a year in power bills—enough to pay their cost in a year or two. Discuss your power bill with a Westinghouse engineer . . . he'll be glad to give you definite savings figures. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-60637



In this large textile mill, power-factor improvement is provided by an individual dust-tight Westinghouse capacitor with each spinning frame motor. Motor control also connects and disconnects capacitors.



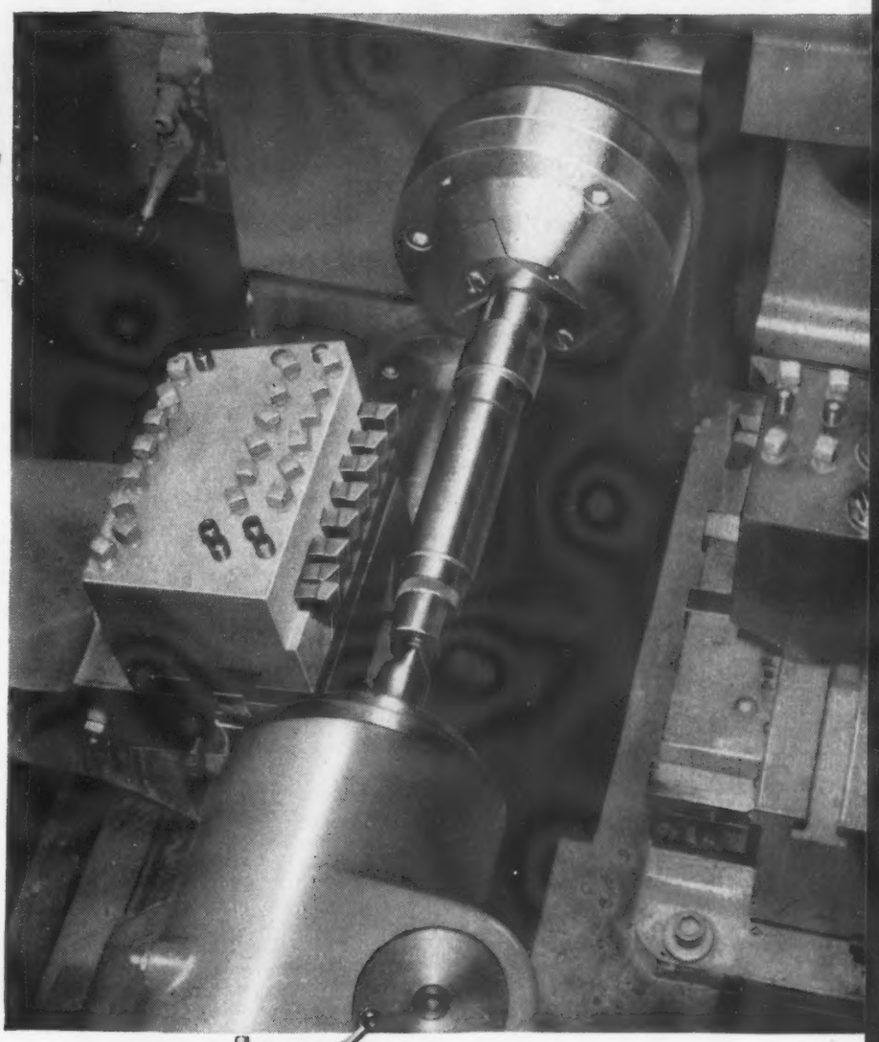
Westinghouse Inerteen Capacitors are fireproof and have hermetically-sealed, welded steel cases. The exclusive "Solder-Seal" bushing eliminates the need for gum or gaskets and assures a permanent seal. There's nothing to wear out.

Westinghouse

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

*Capacitors*

# MAKING *Time Count...* *on a* GISHOLT HYDRAULIC AUTOMATIC LATHE

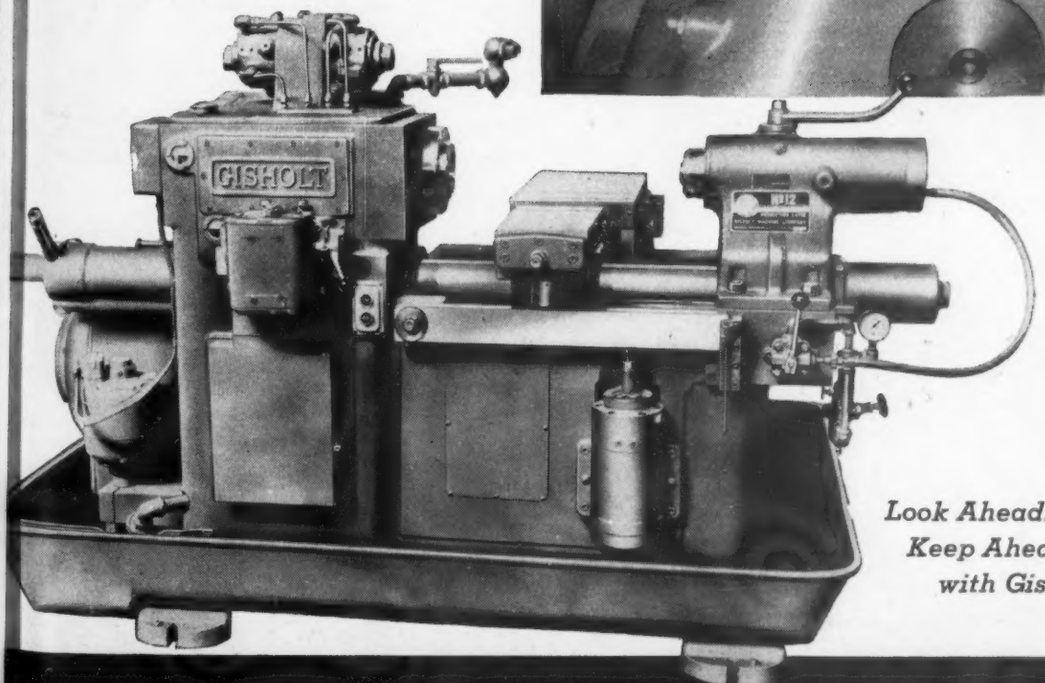


ou expect an automatic lathe to be fast, of urse. And this one is. But you might not ve expected one to be so versatile, so easy tool, so simple to control.

Here, the job is that of machining an im- ller drive shaft gear with the piece held an arbor. The front carriage traverses rward to plunge the cutting tools, and n feeds longitudinally to finish three sur- es. Facing cuts are taken by the rear de. Machine time is 1½ minutes. Two bors are used to save time of loading dur- g the machine's cycle.

Whether yours is an arbor or a chucking b—whether it is between-centers or fix- re-held work, the Gisholt Hydraulic Au- matic Lathe will handle it with the speed d accuracy that mean a better job at wer cost. This is a good time to get all e facts about it. Write us.

**ISHOLT MACHINE COMPANY**
*217 E. Washington Ave., Madison 3, Wis.*




THE GISHOLT HYDRAULIC AUTOMATIC LATHE *is a versatile single spindle lathe essentially different from comparable machines. It has 12" swing over front carriage; 22" length between-centers. Completely automatic, it requires only a minimum of training to operate it.*

*Look Ahead...*
*Keep Ahead...*
*with Gisholt*

GISHOLT

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

## Call BRANDT for

# SPECIALIZED STAMPINGS

## and Pressed Steel SPOT WELDED ASSEMBLIES

No matter what your special stamping needs are, you can rely on Brandt to meet them. Brandt specialized stamping facilities cover a wide range in sizes and metals. For specialized stampings of medium or large size, of mild steel, stainless steel, aluminum, magnesium or alloy metals, you can depend on Brandt. Modern hydraulic presses, skilled craftmanship and competent engineering supervision assure you close finishes of equal precision on small run or mass production orders.

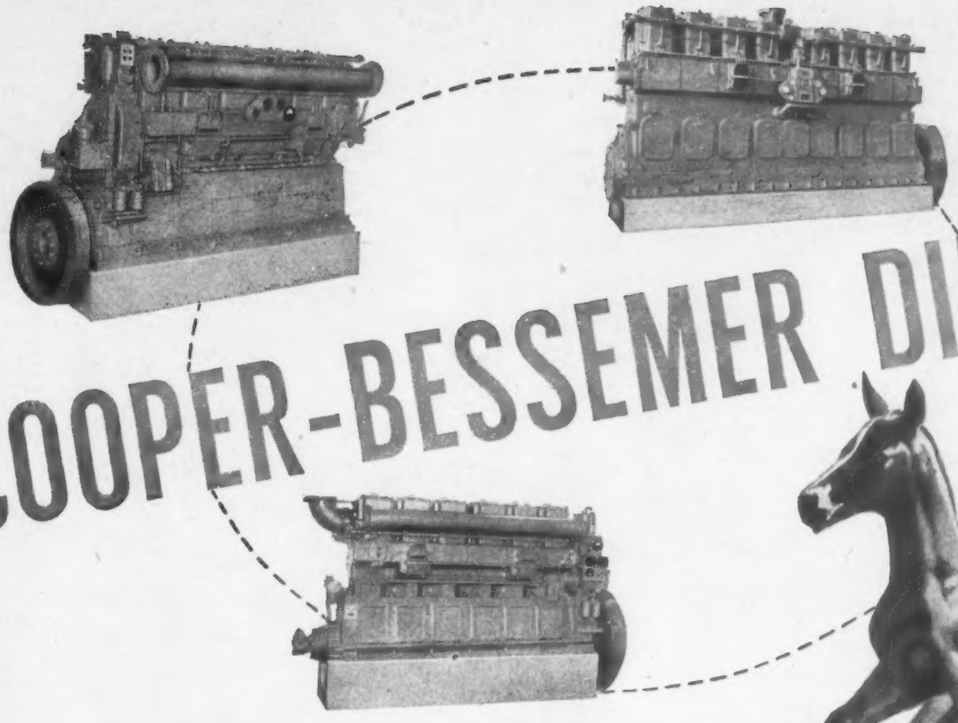
Other Brandt specialized services will hold down the total cost of your complete assemblies. Facilities for heavy weldments. . .spot welding. . .forming. . .and plate fabrication to precise standards are gathered under the same roof, available to you.

**Our capacity to serve you now is of course dependent upon prevailing unsettled conditions.*

Call **BRANDT**
BALTIMORE

**CHARLES T. BRANDT, INC., 1700 RIDGELY ST., BALTIMORE-30, MD.**

*Precision* METAL CRAFTSMEN SINCE 1890 ★ ★ ★ ★



# COOPER-BESSEMER DIESELS

## HORSEPOWER
## *That Stays "Young" Longer*

THERE are a lot of good sound reasons why Cooper-Bessemer Diesels stay "young" and vigorous as a colt for more years than you'd dare expect. There are five reasons that are particularly important.

**1.** Tough Meehanite Metal takes the place of all ordinary iron castings. It's stronger, is less subject to wear and corrosion, will better withstand all kinds of punishment.

**2.** Bearings are precision machine-finished . . . and to amazingly close tolerances. Far better than hand finished, hand fitted bearings, they prove their superiority in longer life and less maintenance.

**3.** Pistons are evenly oil-cooled by Cooper-Bessemer's own Turbu-flow principle, effectively preventing piston distortion, and greatly prolonging life of rings, liners and pistons.

**4.** Cooper-Bessemer's patented piston pin-to-rod assembly almost doubles the usual bearing area, greatly reducing pressures and multiplying bearing life.

**5.** Pistons are electroplated to eliminate scuffing, to minimize friction, and to assure perfect breaking in for a long healthy life.

The Cooper-Bessemer office nearest you will be glad to give you more reasons why these modern Diesels offer you exceptionally fine service and unusually low operating cost. There are Cooper-Bessemer Diesels for every type of service from 100 to 1800 horsepower.

*The*
**Cooper-Bessemer**
*Corporation*

***MOUNT VERNON, OHIO — GROVE CITY, PENNA.***

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St. Louis Houston Los Angeles Shreveport
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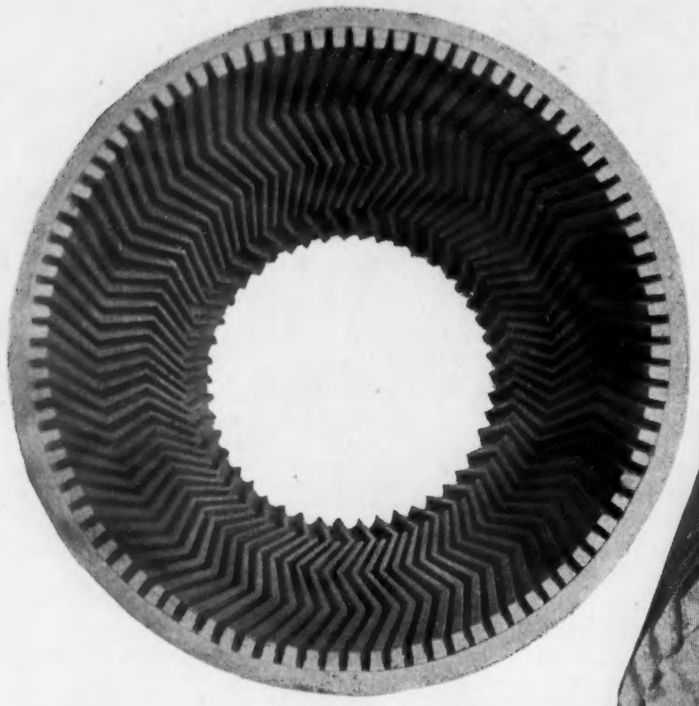
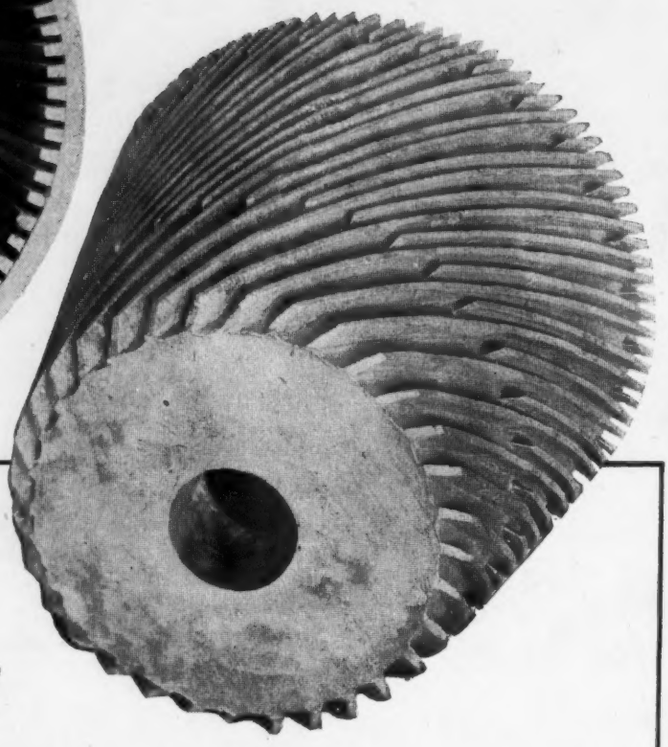


*Steel Castings for Pulp Grinders*



## HARD... for cutting

## TOUGH... for long wear

Chewing and grinding up wood into pulp is no "sissy" job for any machine.

That's why the plugs and shells of modern pulp grinders are *cast* in alloy steel, hardened to increase its resistance to wear.

Just imagine what a job it would be, and how much it would cost, to produce these parts by any other process than casting.

Here, the designer gets the form he wants, and the metallurgist gets the properties he needs, by a simple, inexpensive process.

Remember that cast steel is not another metal. Casting is merely another way to make things out of steel. And a very practical and economical way.

Whether the parts you want are simple or complicated in design, your steel foundryman can help you with his experience, and with the extensive research of this industry behind him.

The first step in building an improved product, or in cutting costs, is to plan it that way—a steel castings engineer can help you. Steel Founders' Society, 920 Midland Building, Cleveland 15, Ohio.

MODERNIZE AND IMPROVE YOUR PRODUCT WITH

# STEEL CASTINGS

# Get ALL the advantages of magnetic holding

## *Use Brown & Sharpe Permanent Magnet Chucks*

### COST NOTHING TO OPERATE . . . EVEN TO INSTALL

★ No electricity, wires, electrical connections, generators or brushes.

★ Nothing to maintain. Special alloy magnets retain energy indefinitely.

### SAFE FOR WORKMAN AND WORK

★ No danger of work flying off due to power interruption.

★ Work can be left on chuck indefinitely without danger of heating either chuck or work.

### SIMPLE MECHANICAL CONTROLS

★ Hand-operated. Easy 180° movement from ON to OFF position.

★ POSITIVE HOLDING

★ INSTANT RELEASE

★ plus wide variations of holding force for easy positioning of work.

### MORE USEFUL IN MORE PLACES

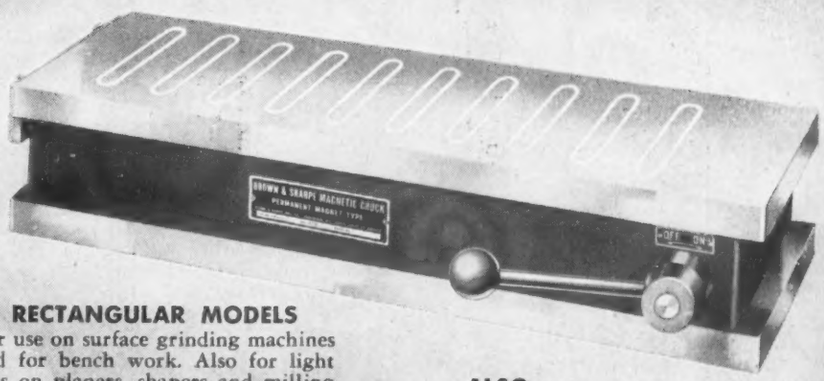
★ Portable . . . for use on various machines, also for testing, inspection and laying out work.

★ Wet or dry grinding.

★ Large, heavy work or groups of small parts.

★These chucks are for sal only in the United States c America and its Territorie

**ROTARY MODEL**
for grinding operations and light cuts on lathes.




**RECTANGULAR MODELS**
For use on surface grinding machines and for bench work. Also for light cuts on planers, shapers and milling machines.

**ALSO** permanent magnet V blocks and dial test indicators with magnetic bases.

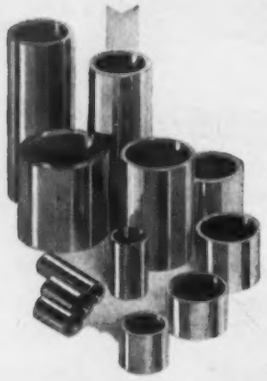
*WRITE FOR CATALOG describing operating principles.*

**BROWN & SHARPE MFG. CO., Providence 1, R. I.**

# BROWN & SHARPE

# JOHNSON BRONZE

# ONE STOP SERVICE



GENERAL PURPOSE BEARINGS

JOHNSON

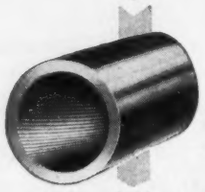
BABBITT

Ledaloyl
SELF LUBRICATING

SELF LUBRICATING BEARINGS

UNIVERSAL BRONZE BARS

ELECTRIC MOTOR BEARINGS



GRAPHITED BRONZE

## *Everything*

## You need in

## BEARING BRONZE

There is a complete Bronze Bearing Service as near as your telephone. Simply look in the classified section of your telephone book . . . under BRONZE. Select the name of your local Johnson Distributor. Then give him a call.

Johnson Distributors can quickly supply you with everything you need in Bearing Bronze. In bars they offer you a range of over 350 sizes. In stock size bronze bearings you can select any of over 850 sizes. Electric Motor bearings come in more then 250 individual types. Babbitt, Ledaloyl, (powder metallurgy) and graphited bronze are all available from *stock*. Every item in the line is the highest quality possible.

Why not call your local distributor—NOW? Give him the opportunity to demonstrate his exceptional service. The bronze will prove its quality through performance.

***Catalogue***

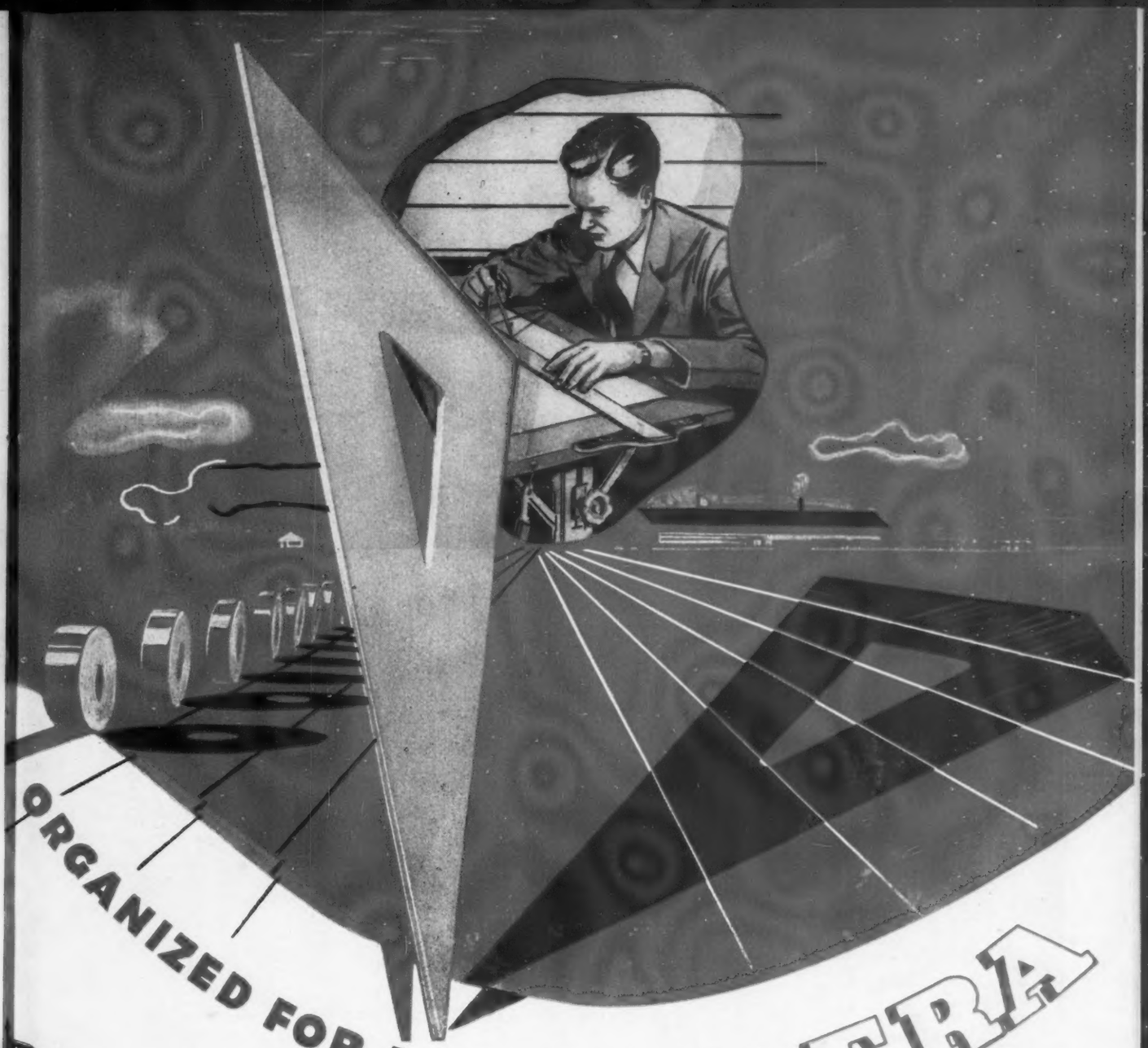
76 pages filled with interesting, informative data—fully illustrated. It's FREE.

# JOHNSON BRONZE

SLEEVE BEARING HEADQUARTERS

The MOST COMPLETE SLEEVE BEARING SERVICE in the WORLD

550 S. MILL STREET NEW CASTLE, PA.



# ORGANIZED FOR A NEW ERA

*The ability which won the Army-Navy "E" and four stars is now available to American industry.*

Tomorrow's metals will be rolled and processed on modern equipment. From the minds of aggressive engineers will come the plans for future mill machinery . . . their knowledge and past experience will assure efficient operation.

Although young as a corporation, Arms-Franklin was organized for just such a future. Alert and vigorous, intent upon tomorrow's processes, the individuals are rich in experience, each with a successful record of accomplishment. Rolling mills, tables, picklers, sheet and plate levellers, straighteners, slitting lines and other equipment operating in many plants were designed and built by these practical men. Consult them on plans for economical production of tomorrow's rolled metals.

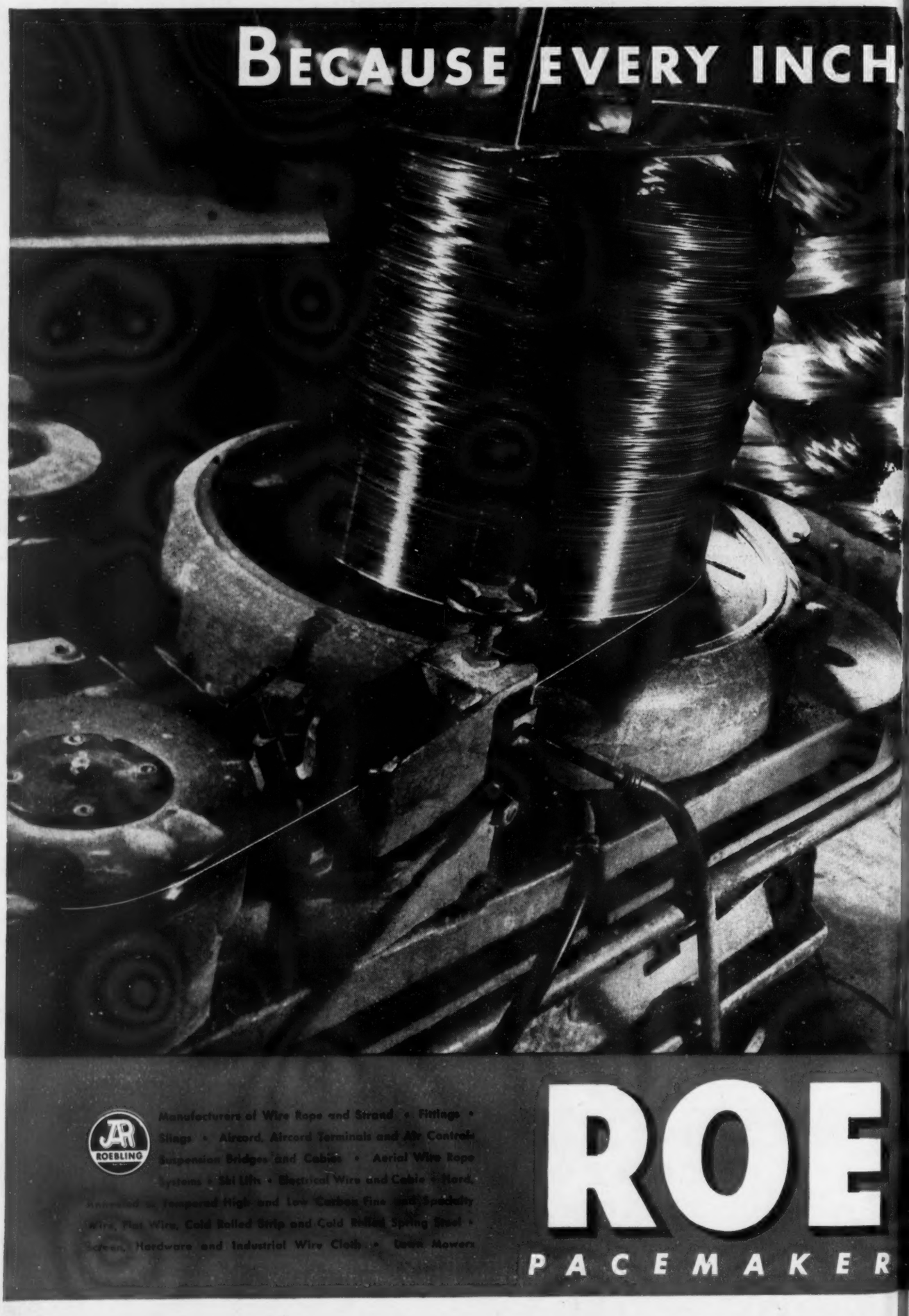
## The ARMS-FRANKLIN CORPORATION

YOUNGSTOWN 3, OHIO

Subsidiary Company

TAYLOR-WILSON MFG. CO. : Pittsburgh, Pa.

GINEERS AND BUILDERS OF ROLLING MILL MACHINER


BECAUSE EVERY INCH
JR
ROEBLING
Manufacturers of Wire Rope and Strand • Fittings • Slings • Aircord, Aircord Terminals and Air Controls • Suspension Bridges and Cables • Aerial Wire Rope Systems • Ski Lifts • Electrical Wire and Cable • Hard, Annealed or Tempered High and Low Carbon Fine and Specialty Wire, Flat Wire, Cold Rolled Strip and Cold Rolled Spring Steel • Screen, Hardware and Industrial Wire Cloth • Lawn Mowers
ROE
PACEMAKER

# IS LIKE EVERY OTHER INCH

## ROEBLING Wire Helps Keep Production Rolling . . .

## *and Cuts Costs!*

When you specify Roebling Round Wire you expect to get wire that meets *all* your specifications exactly. And because you do get it that way—absolutely uniform in quality every inch of the way—you can figure on saving three ways:

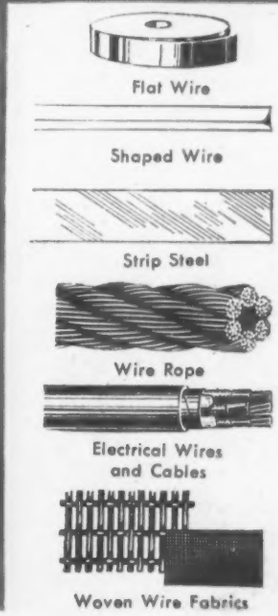
1. **Rejects and scrap dwindle to a minimum.**
2. **Shutdowns are fewer, production schedules better maintained.**
3. **Output is up, for preparation time is less . . . operation faster, smoother.**

Improve your product with the right wire—right throughout in grain structure and gauge and temper, ductility and finish—by checking with Roebling. Roebling has the equipment and the experience to take your most exacting wire requirements in stride. And with his wide industrial background, your Roebling Field Engineer may well be able to show you new ways of cutting production corners—and costs—with Roebling Round Wire.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON 2, NEW JERSEY
*Branches and Warehouses in Principal Cities*

Round Wire

**ROEBLING PRODUCTS**



Flat Wire
Shaped Wire
Strip Steel
Wire Rope
Electrical Wires and Cables
Woven Wire Fabrics

# BLING

*IN WIRE PRODUCTS*



DETROIT PUBLIC LIBRARY

# A Complete Blade Service

***The MARVEL System of Metal Sawing provides not only the most advanced and most complete line of metal sawing machines built, but also a complete metal-cutting blade service which includes:***

**(1st) MARVEL High-Speed-Edge Hack Saw Blades**— positively unbreakable, composite blades with a high speed steel cutting edge welded to a tough alloy steel body. Hardened "eyes" permit greater blade tension. Extra strength makes practical greatly increased speeds and feeds—in fact, these blades make possible today's fast automatic hack saw machines.

**(2nd) MARVEL High-Speed-Edge Hole Saws**— hole saws with strength for use on drill presses and lathes. Diameters from ⅝" to 4½" with high speed steel pilots. Cut big holes at low cost in steel to 1⅛" thick.

**(3rd) MARVEL Metal-Cutting Band Saw Blades** come ready-welded (endless) and individually boxed. (*Order by make and model of machine and number of teeth per inch.*) MARVEL'S individual boxing prevents damage to teeth, kinking or loss thru rust in shipping, storing or handling. Specify MARVEL Band Saw Blades for top quality and top performance.

**ARMSTRONG-BLUM MFG. CO.**

*"The Hack Saw People"*

5700 Bloomingdale Ave. Chicago 39, U.S.A.
Eastern Sales Office: 225 Lafayette St., New York 12, N. Y.

# *Yoloy doors!*

## ASK THE MAN WHO OPERATES THEM

YOU can usually tell a Yoloy boxcar door, because it opens and closes so easily and smoothly. Here are the reasons why:

1. Compared to standard hot-rolled carbon steel, a Yoloy door is 25% or more lighter in weight. This makes it easier to open and close.
2. Yoloy is much stronger and tougher than ordinary steel--more resistant to shock, impact, vibration and abrasion. It stands abuse and holds its shape better. This, also, makes a Yoloy door easier to open and close.
3. Yoloy is corrosion resistant. Therefore, a Yoloy door is not so adversely affected by moisture, or corrosive materials hauled. That, too, makes it easier to open and close.

Yoloy is Youngstown's well-known low alloy high-tensile, corrosion resistant steel. It brings you these advantages, with a greatly increased life compared to previously used materials. If you aren't acquainted with Yoloy, investigate its advantages now for boxcar doors and sides, as well as for its many other railroad uses.

One of 500 new box cars recently put into service by the Santa Fe railroad, all equipped with Yoloy doors fabricated by The Youngstown Steel Door Co.

QUALITY TRADE MARK YOUNGSTOWN SERVICE

**YOUNGSTOWN**

THE YOUNGSTOWN SHEET AND TUBE COMPANY

GENERAL OFFICES - YOUNGSTOWN 1, OHIO

Export Offices - 500 Fifth Avenue, New York City

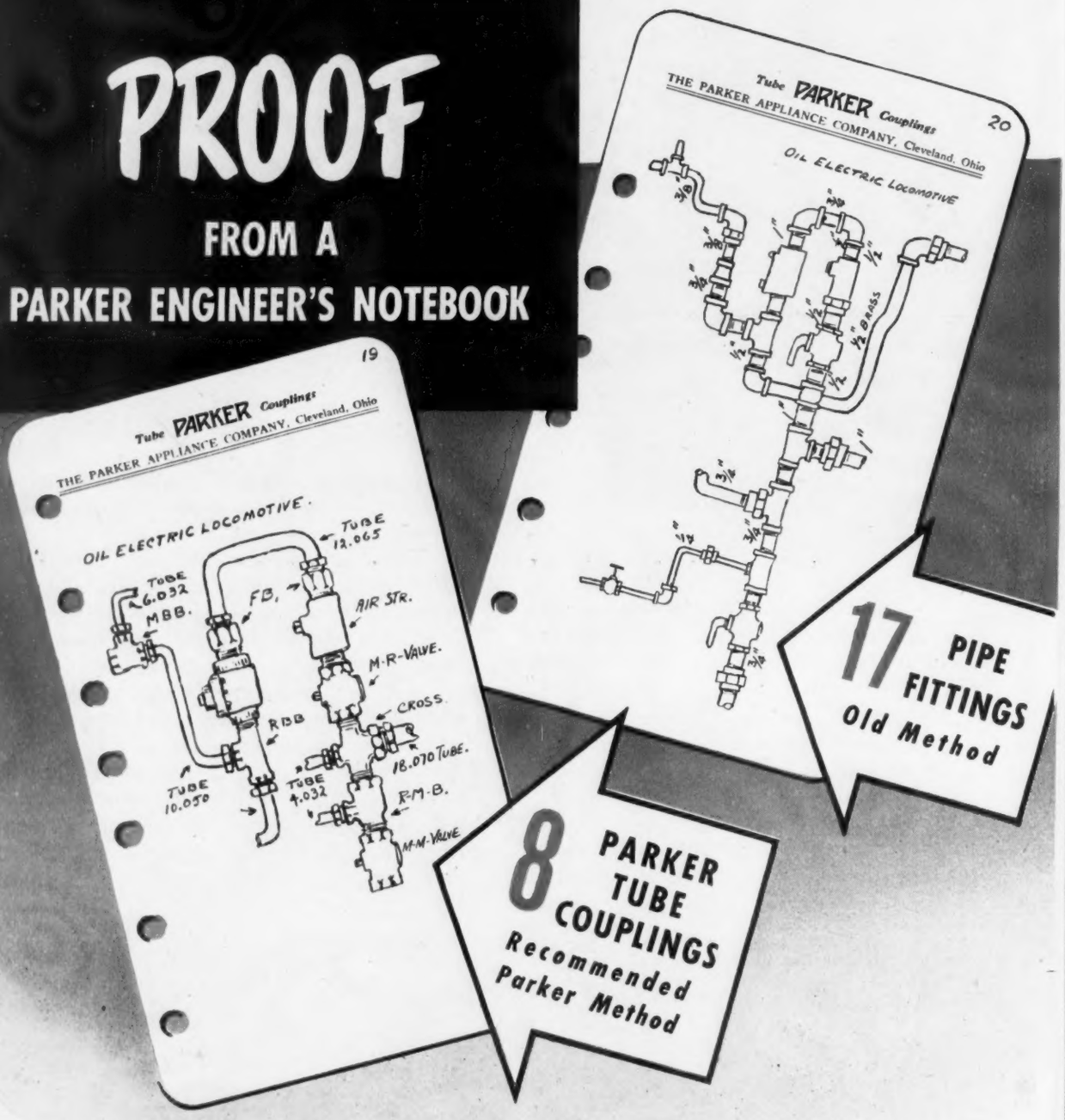
Manufacturers of

CARBON - ALLOY AND YOLOY STEELS

Sheets-Plates-Pipe and Tubular Products-Bars-Rods-Wire-Cold Drawn Carbon Steel Rounds-Tie Plates and Spikes-Conduit-Electrolytic Tin Plate-Coke Tin Plate

# PROOF

## FROM A PARKER ENGINEER'S NOTEBOOK




Better than a two-to-one advantage from the standpoint of number of connections, alone!

But that's only *one* advantage of Parker Fluid Power Engineering. Take the actual case pictured: the circuit is more compact, more efficient, cleaner (because there are no sealing compounds or pipe threading operations), and it's vibration-proof, too.

Every Parker fitting is a *coupling*—easy to disassemble without disturbing the circuit or using gaskets and compounds. You'll save time, money and materials at every stage.

May we show you how Fluid Power can be engineered to your requirements?

* * *

Standard Parker valves and couplings are built in sizes to cover a wide range of exacting conditions—stocks are available at your distributors and at Parker warehouses.

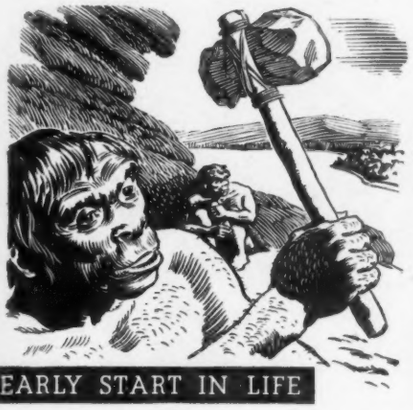
## THE PARKER APPLIANCE CO.

NEW YORK • DAYTON • CLEVELAND • CHICAGO • LOS ANGELES

FLUID POWER PRODUCTS FOR ALL INDUSTRY

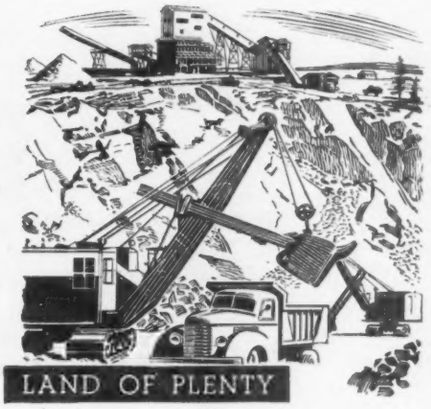
ONE OF A SERIES OF STORIES ABOUT ALLOYING METALS . . . WHERE THEY COME FROM AND HOW THEY ARE USED

# THE STORY OF SILICON



## EARLY START IN LIFE

Way back in the Stone Age are found the first uses of silicon—in the tools and weapons used by prehistoric man. These were made of flint, which is almost pure silica, and in silica many centuries later the Swedish chemist Berzelius discovered the element silicon. He produced the world's first ferrosilicon in 1810.

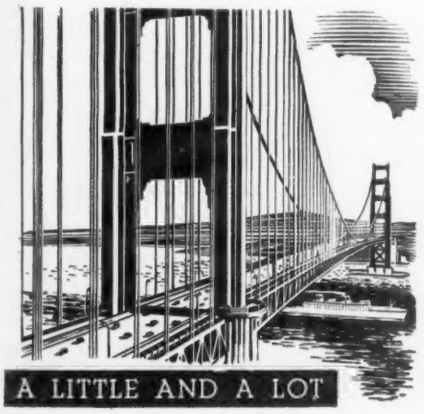


## LAND OF PLENTY

"Earth former" is what silicon has been called, for it is present in most all rocks, clays, soils, and even many semi-precious stones. More than one fourth the earth's crust is silicon—the most abundant element, next to oxygen. Electromet digs into mountain after mountain for high-quality silicon ore.

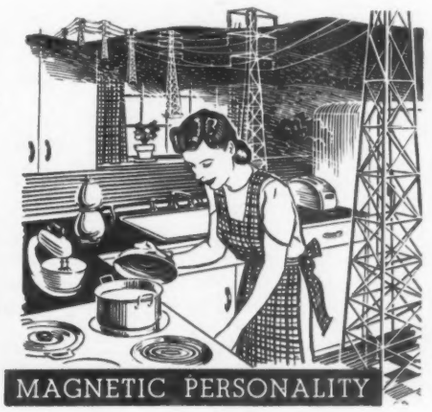
## HOUSECLEANING SPECIALIST

Silicon does a "clean-up job" in iron and steel production, serving as both scavenger and deoxidizer. From the molten bath it removes harmful oxides and gases. Silicon is used for refining practically all alloy steels and many grades of carbon steel. It is second only to manganese in its usefulness in steelmaking.



## A LITTLE AND A LOT

From about 0.20 to 1.50 per cent silicon goes into many structural steels—such as those used for highly stressed parts of bridges. In larger percentage, sometimes as much as 17 per cent, silicon equips cast irons to handle highly corrosive acids in chemical plants. Silicon also serves as a softener in cast iron.



## MAGNETIC PERSONALITY

The heart of the mysterious transformer is made of steel containing silicon. Silicon is essential in sheet steel for electromagnets, generators, and other electrical apparatus because of the special magnetic and electrical properties it imparts to the steel. It has brought about tremendous power savings.

## Cream Of The Crop

**Electromet's interest in silicon dates back almost 50 years, for in 1898 the broad patent claims of de Chalmot were assigned to the Willson Aluminum Company, one of the predecessors of Electro Metallurgical Company. With its long experience in ferro-alloys production, Electromet naturally knows how to give all its customers alloys of high quality and purity. Write for the booklet "Electromet Ferro-Alloys and Metals," which will tell you more about silicon and the other Electromet alloys.**

**ELECTRO METALLURGICAL COMPANY**

Unit of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

**ELECTROMET Ferro-Alloys and Metals are sold by Electro Metallurgical Sales Corporation and Electro Metallurgical Company of Canada, Limited, Welland, Ontario.**

**Electromet**

TRADE-MARK

Ferro-Alloys & Metals

# Iridite Offers a Fast, Sure Way to Lick Corrosion in Zinc, Cadmium, Galvanizing!

By the stop-watch . . . by the salt-spray . . . from every angle . . . Iridite gives you an anti-corrosion agent that will boost sales appeal and profits in your zinc, cadmium and galvanized products.

**EASY TO USE!**

*It's as simple as this to use:* Immerse your parts manually or automatically—in single racks or in bulk —*for only 15 to 60 seconds*—in an Iridite solution. No special equipment needed. No slowing up of fast-moving, automatic production lines. Normal shop temperatures suffice. And the Iridited parts dry in a few seconds for immediate handling, packing and shipping.

**MANY APPLICATIONS!**

Use Iridite as a final protective finish . . . as a paint base for permanent adhesion . . . as a cost-cutter in combination with galvanizing or zinc plate to replace more expensive materials. No matter how you use it, Iridite *unites chemically* with the zinc or cadmium . . . won't flake, chip or peel when the part is bent . . . won't alter dimensions on the closest tolerance part.

**TEST IT YOURSELF!**

Iridite is currently available in colorful, eye-appealing red, blue, green, bronze, olive drab, black and transparent Iridite-Bright. Send for a free test panel . . . half coated with Iridite, half unprotected. Check it in your laboratory. See for yourself how Iridite puts the "finishing touch" on your products . . . the "profitable touch" on your sales! Rheem Research Products, Inc., 1403 Standard Oil Building, St. Paul and Franklin Streets, Baltimore 2, Maryland.

**BRANCHES**—570 Lexington Ave., New York 22; 20 E. Jackson Blvd., Chicago 4; 2411 Sichel St., Los Angeles 31. Distribution in: Waterbury; Grand Rapids; Detroit; Los Angeles; Long Island City.

**RHEEM RESEARCH PRODUCTS, INC.**

**IRIDITE**

**Standard Oil Bldg., Baltimore 2, Md.**

Reg. U. S. Pat. Off.

# *In the Old Battle for New Ways*
## TO REDUCE PRODUCTION COSTS

... improved materials handling, because in the past so often neglected, probably holds greater possibilities than any other element of cost in modern production.

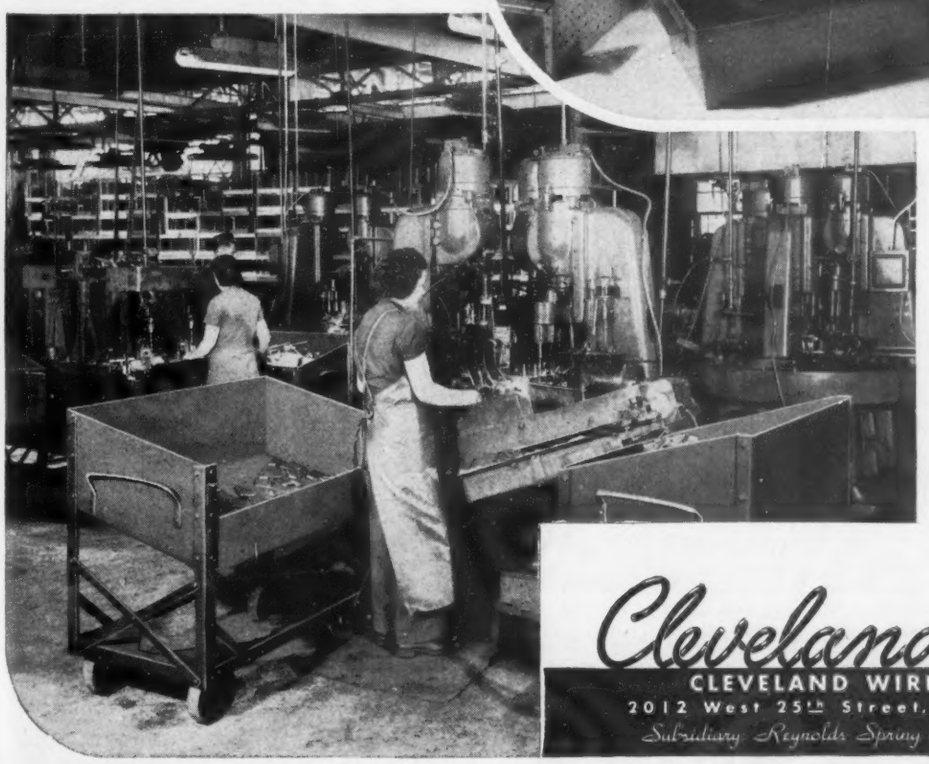
Production has aptly been called "materials in motion"—*in* machines and processing equipment, as well as *between* them and departments for finishing, packaging, storage and shipment.

This often calls for "Cleveland" shop containers and other steel equipment designed and built to fit individual needs, because the mass production of small products permits of no compromise with efficiency or fitness for their intended functions. "Cleveland" make stock as well as special sizes and models, specializing in designing and building to order to suit individual requirements.

**STEEL FACTORY EQUIPMENT DIVISION**
**CLEVELAND WIRE SPRING COMPANY**

## ORIGINAL IDEAS!

Replacing boxes of more conventional type the Soss Mfg. Co., Detroit, uses a smaller number of relatively large capacity box trucks for most efficient handling of small products, (hinges) as here illustrated. Much time is saved by elimination of repeated pickups with separate truck and restacking. Where, as in this plant, successive operations are numerous, calling for frequent moves between machines or departments in close proximity, this idea has many advantages.

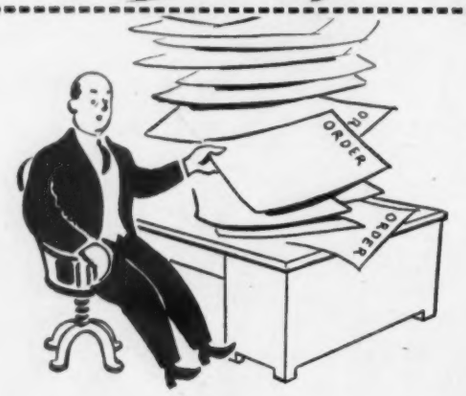


**ASK FOR CATALOG**

of "Cleveland" steel shop boxes, barrels, stools, hand trucks, tool boxes and cabinets, racks, bins, etc. Contains many valuable suggestions.

Cleveland **STEEL SHOP EQUIPMENT**
**CLEVELAND WIRE SPRING CO.**
2012 West 25th Street, Cleveland 13, Ohio
*Subsidiary Reynolds Spring Company, Jackson, Mich.*

# "BROTHER _




## Do We Wish We Could Deliver More SPEED CASE x1515!"

The unprecedented demand for Speed Case Steel would keep us humping to meet deliveries even under normal conditions . . . and in these times * ! ? (!) * ! ! !

SO . . . why do we continue to advertise? Well, we talked it all over and it's like this. Present conditions CAN'T last and fast machining, excellent carburizing Speed Case Steel is so outstanding in solving so many and varied production problems, encountered when using B1112, B1113, C1117, C1118, C1019, etc., that we want you to continue finding out about it.

We want you to ask for our Brochure which tells the whole story of this revolutionary steel, with actual case histories.

**We invite you to ask for the services of our Speed Case Production expert. He will visit you, after samples have been provided you, and show you how to set up your tools for faster and more successful production with Speed Case x1515 Steel.**

***. . . it is worth waiting for!***

**ACTUAL PHOTOGRAPH**
**Speed Case Steel (.20 carbon) 1 inch cold drawn bar tied in a knot, cold, without fracture.**

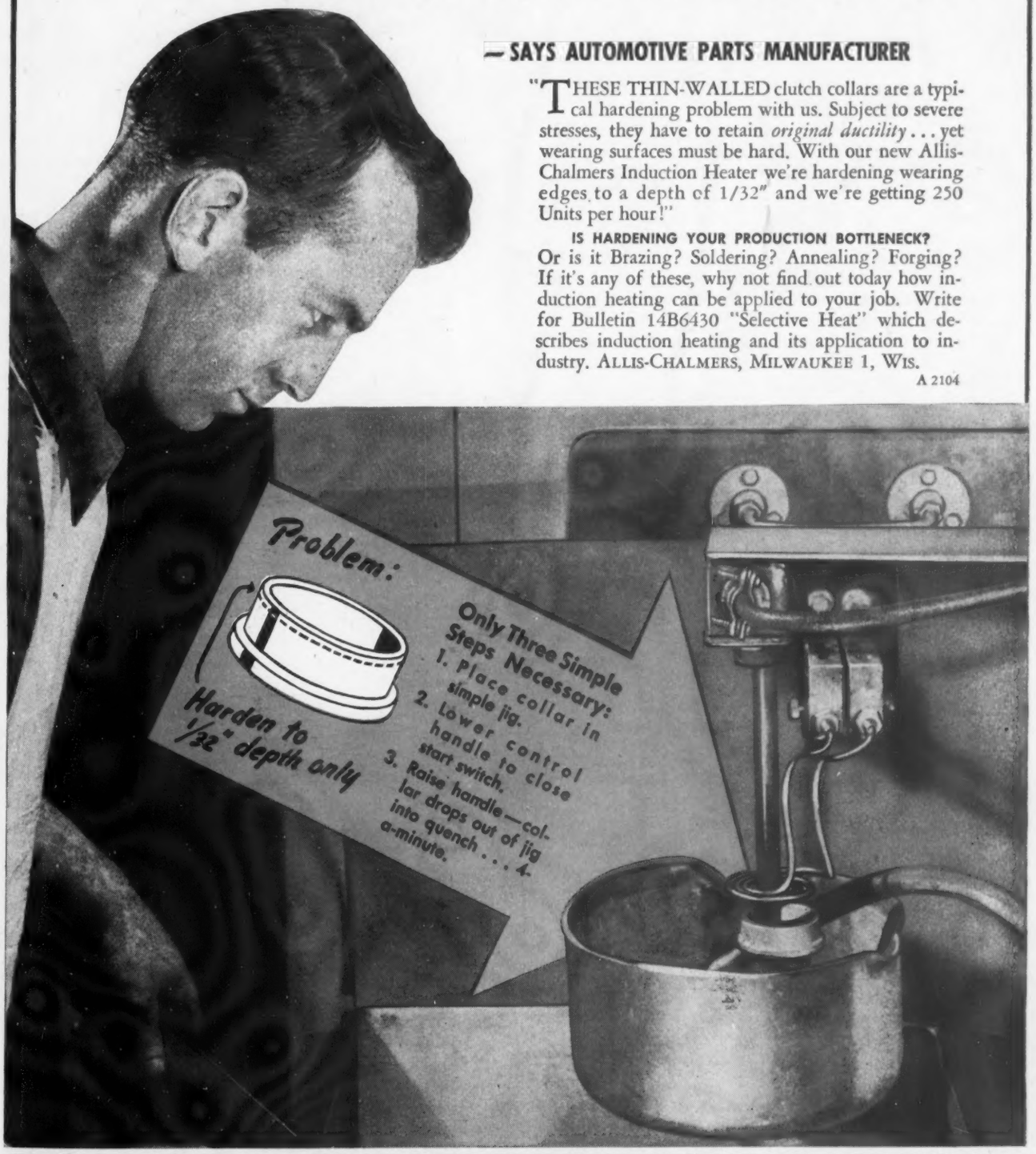
*Tear this off* . . . **ATTACH TO YOUR LETTERHEAD AND MAIL TO EITHER COMPANY BELOW**

*Licensee for Eastern States*
**THE FITZSIMONS COMPANY**
YOUNGSTOWN, OHIO

**MANUFACTURERS OF A COMPLETE LINE OF COLD FINISHED CARBON AND ALLOY STEEL BARS**

*Licensor*
**MONARCH STEEL COMPANY**
HAMMOND · INDIANAPOLIS · CHICAGO
PECKOVER'S LTD., Toronto, Canadian Distributor

# "We're Induction Hardening 4-a-Minute Without Distortion!"


Problem:
Harden to 1/32" depth only
Only Three Simple Steps Necessary:
1. Place collar in simple jig.
2. Lower control handle to close start switch.
3. Raise handle—collar drops out of jig into quench . . . 4-a-minute.

## —SAYS AUTOMOTIVE PARTS MANUFACTURER

"THESE THIN-WALLED clutch collars are a typical hardening problem with us. Subject to severe stresses, they have to retain *original ductility* . . . yet wearing surfaces must be hard. With our new Allis-Chalmers Induction Heater we're hardening wearing edges to a depth of 1/32" and we're getting 250 Units per hour!"

**IS HARDENING YOUR PRODUCTION BOTTLENECK?**

Or is it Brazing? Soldering? Annealing? Forging? If it's any of these, why not find out today how induction heating can be applied to your job. Write for Bulletin 14B6430 "Selective Heat" which describes induction heating and its application to industry. ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2104

**ALLIS-CHALMERS**

One of the Big 3 in Electric Power Equipment
★ Biggest of All in Range of Industrial Products ★

**INDUCTION HEATERS**

HERE'S HOW YOU CAN...

# IMPROVE QUALITY
# INCREASE PRODUCTION
# CUT PRODUCTION COSTS

with General Electric Industrial X-Ray Units

The experience of hundreds of satisfied users provides concrete evidence that G-E X-Ray Industrial Units pay real dividends—both scientific and economic.

One of the nation's leading producers of heavy steel castings has collected tangible dividends from its investment in a G-E X-Ray million-volt unit. Here are the facts:

## IMPROVED QUALITY

Detection of internal defects in castings is by no means the sole advantage of x-ray inspection. Routine radiographic examination of intricate castings is employed to inspect areas which may be highly stressed in service. Castings so inspected may be used with complete confidence for service in fields where higher stresses are encountered.

## CUT PRODUCTION COSTS

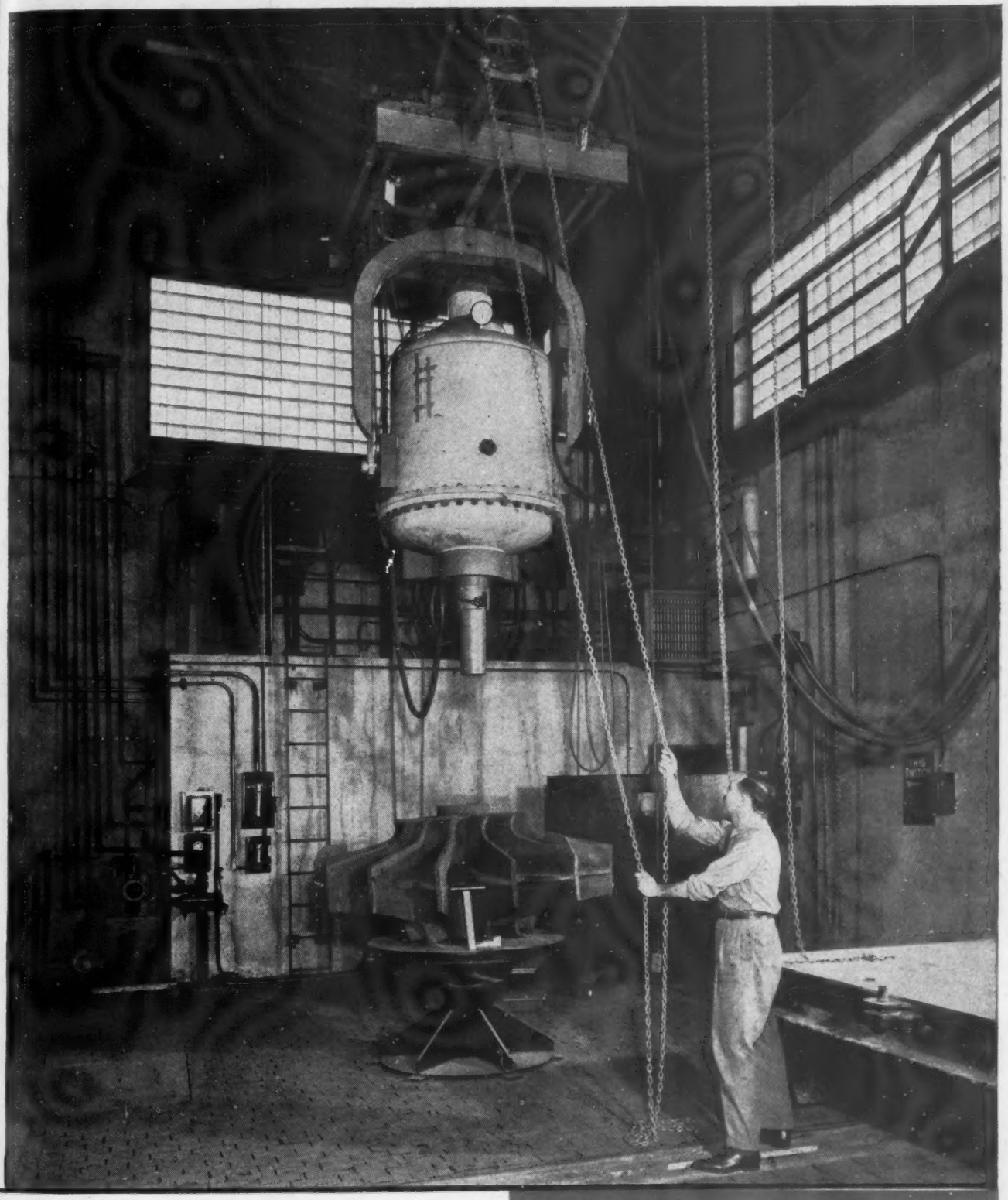
With day-to-day precision production control, if changes are indicated they may be made quickly and accurately without the costly sectioning of one casting. In instances where repair welding is necessary, a rapid radiographic survey of the area in question reassures both the foundryman and the customer that an adequate amount of metal has been removed and the welding properly done.

## INCREASED PRODUCTION

Radiography with the 1000 kv unit provides a rapid, non-destructive check on the soundness of production castings and permits the inspection of a larger percentage of the product than would otherwise be possible. Such production control enables the foundryman to verify his molding technic on a day-to-day basis.

## THESE BENEFITS CAN BE YOURS

No matter what you manufacture. They are not restricted to the G-E X-Ray million-volt unit. They are available with every G-E X-Ray industrial unit and G-E X-Ray provides a full line of industrial x-ray units having a voltage range and mounting structure best suited to your particular problem.

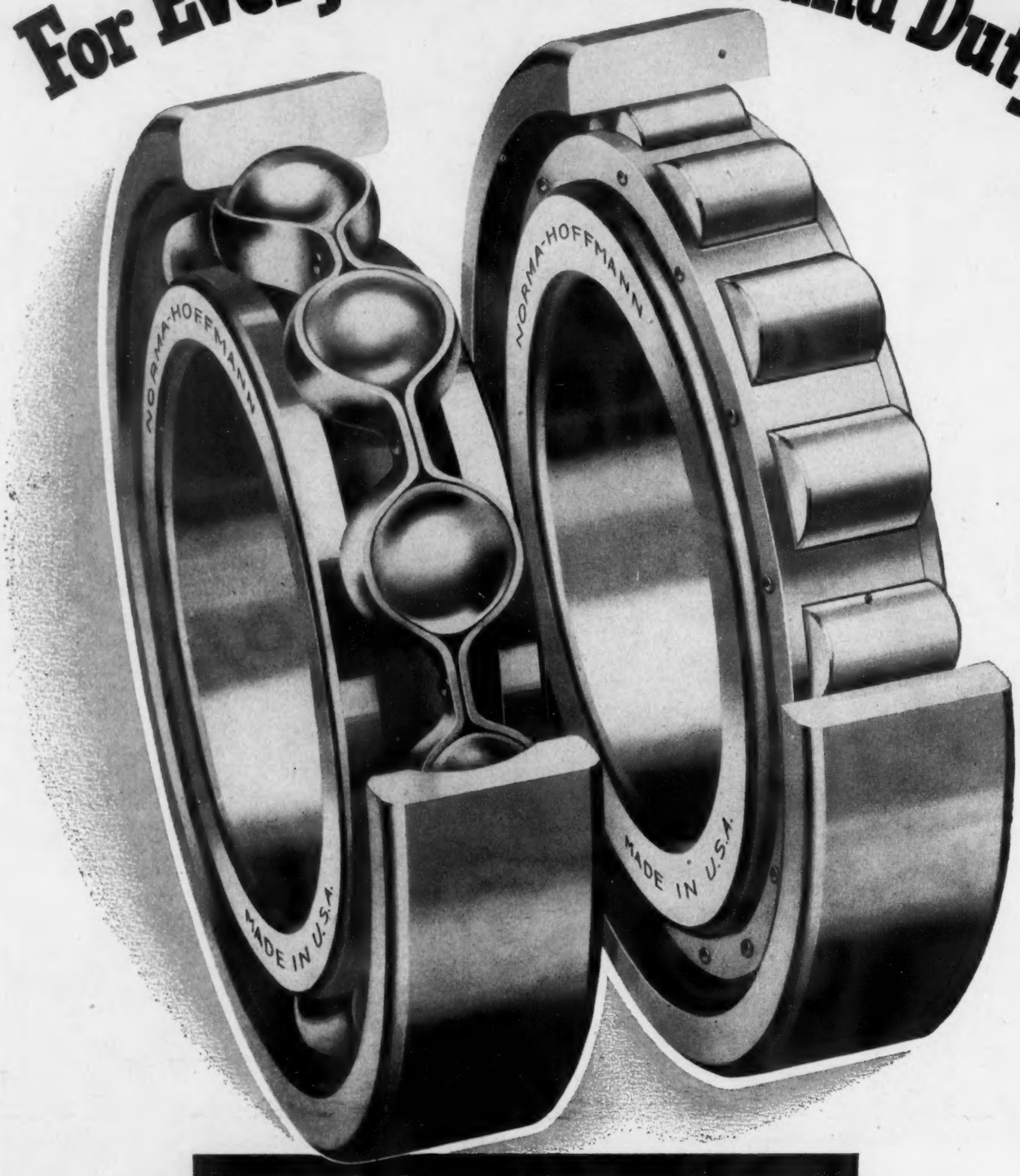


## TO GET FULL INFORMATION

If you're interested in improving quality, increasing production and cutting production costs, you owe it to yourself and to your company to investigate G-E X-Ray's industrial units. For complete information—without cost or obligation—call in G-E X-Ray's experienced industrial engineers. Their services are yours for the asking. Write or wire General Electric X-Ray Corporation, 175 West Jackson Blvd., Chicago 4, Illinois. Address Dept. 2519.

**GENERAL ELECTRIC**
**X-RAY CORPORATION**

# For Every Load, Speed and Duty



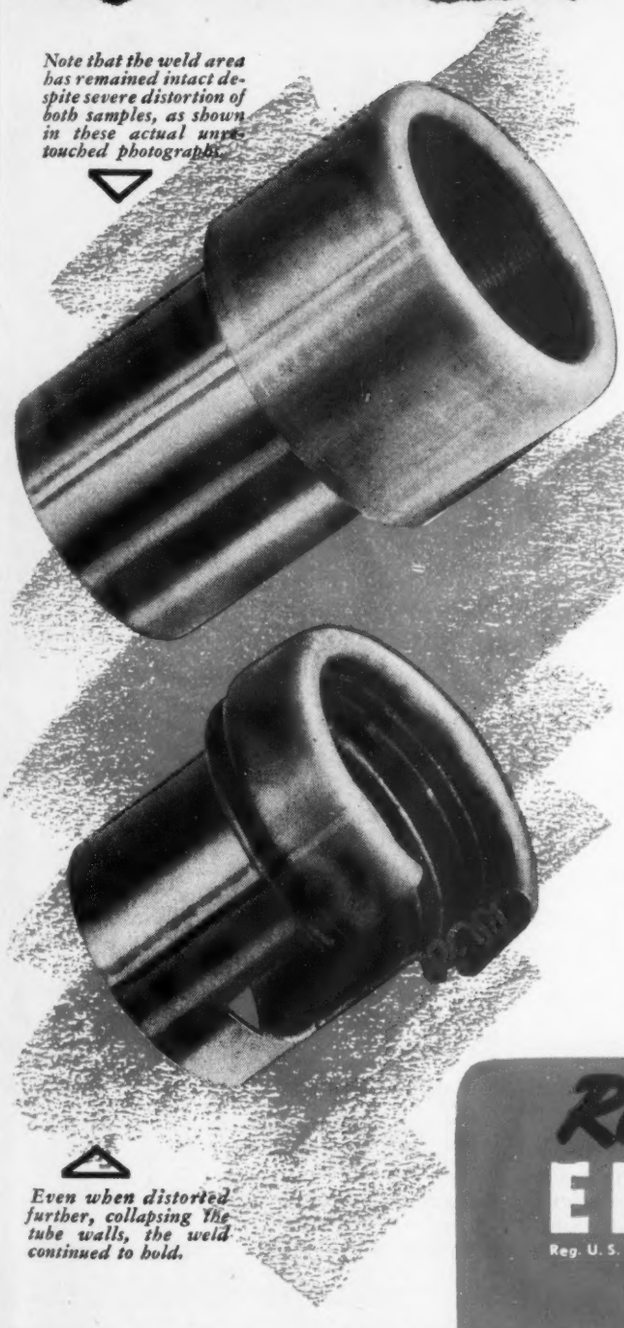

"NORMA-HOFFMANN"

***Precision Bearings***

BALL, ROLLER, THRUST—3000 SIZES

NORMA-HOFFMANN BEARINGS CORPORATION, STAMFORD, CONNECTICUT

# Turning ELECTRUNITE Tubing INSIDE OUT



*Note that the weld area has remained intact despite severe distortion of both samples, as shown in these actual untouched photographs.*

*Even when distorted further, collapsing the tube walls, the weld continued to hold.*

## TO SHOW YOU THE WELD THAT'S AS STRONG AS THE WALL

Literally turned inside out, these two pieces of tubing have but ONE purpose—to show you the strength, toughness and ductility of the weld area in Republic ELECTRUNITE Tubing.

As produced by Republic's *improved* process of electric resistance welding, every inch of the weld throughout every length of tubing is an integral part of the wall . . . no metal is added. Electrical energy creates a smooth, sound weld identical in chemical analysis with the rest of the wall.

This means that you can fabricate ELECTRUNITE Tubing by any method, efficiently and economically, without worry about weld weakness or failure . . . also, that structural safety is an inherent quality of any properly designed product made of this *modern* tubing.

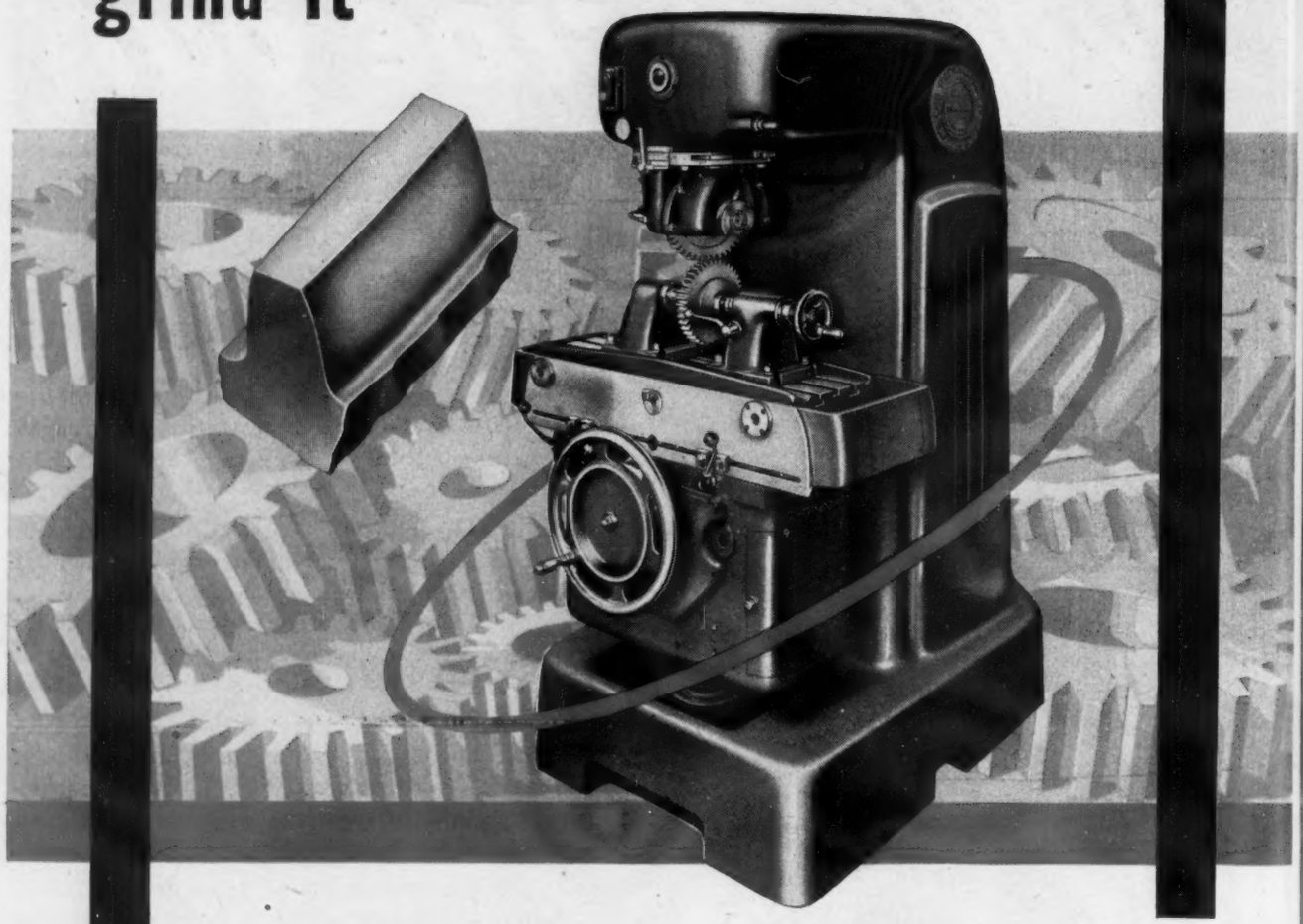
For complete information about Republic ELECTRUNITE Tubing—including a list of sizes, gauges and analyses in both carbon and stainless steel grades—and its many advantages which keep production costs down and product quality up, write to:

**REPUBLIC STEEL CORPORATION**
**STEEL AND TUBES DIVISION • CLEVELAND 8, OHIO**
Export Department: Chrysler Building, New York 17, New York

**Republic ELECTRUNITE TUBING**
Reg. U. S. Pat. Off

**Mechanical, Aircraft, Stainless Steel and Rail Steel Tubing—Boiler, Condenser and Heat Exchanger Tubes**

# YOU CAN SHAVE A GEAR A LOT FASTER than you can grind it



Gears requiring 40 minutes (floor to floor) for grinding are being shaved in just 5 minutes.

The shaved gears are just as accurate dimensionally as the ground gears; tooth surfaces are just as smooth and of equal if not greater importance, the shaved gear teeth are entirely free of those prevalent hairline grinding cracks which so often result in fatigue failures. Thus by shaving you get better gears faster and at less production cost.

Gears are shaved on Red Ring Rotary Shaving Machines which produce smooth tooth surfaces and correct errors of helical angle, profile and eccentricity. Gears from 3/16" to 220" P. D. can be shaved. Those from 3/8" to 36" P. D. can also be crowned to avoid the danger of failure due to "End Bearing."

## NATIONAL BROACH AND MACHINE CO.

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SPECIALISTS ON SPUR AND HELICAL INVOLUTE GEAR PRACTICE

ORIGINATORS OF ROTARY SHAVING AND ELLIPTOID TOOTH FORMS

*An HDT-5610 Alloy 10 High Temperature Furnace at Sivyer Steel Casting Company — Milwaukee*

# FOR ALLOY STEEL CASTING RESEARCH

## SIVYER STEEL ... MILWAUKEE has

done important work for many years in the development of alloy steel. Laboratory control, not only of metal analysis, but of heat treating practices, has been a large factor in their production of high quality castings. ● For pilot heat treating investigations and alloy steel research, Sivyer uses a Hevi Duty Alloy 10 High Temperature Furnace which is particularly suited to research where a controlled high temperature to 2350° F. is required.

*Send for Bulletin HD-339 -- it has the details.*

**HEVI DUTY ELECTRIC COMPANY**

HEAT TREATING FURNACES HEVI-DUTY ELECTRIC EXCLUSIVELY

MILWAUKEE, WISCONSIN

# from the CARDOX case record...

Out of actual on-the-job fire experience comes evidence that Cardox Fire Extinguishing Systems give carbon dioxide a scope of usefulness, and fire extinguishing performance, far beyond the generally recognized advantages of this fast, non-damaging, economical extinguishing medium.

File No. S-88, taken from a user's report to another organization on Cardox extinguishment of a quench tank fire, offers an interesting example of Cardox performance on one of many types of hazard most effectively protected by Cardox $CO_2$.

"Our Cardox System, utilizing a ½-ton $CO_2$ storage unit, protects three hazards—an oil and lacquer storage building, a 950-gallon oil quench tank located in the heat treating departments, and a 1500-gallon oil quench tank located in another building.

"Recently we had a fire in the 950-gallon quench tank. Oil in this tank became ignited when a wire located in the switch cable broke while a 300-lb. steel basket of parts was being lowered into the quench tank at 1400° F.

"The Cardox System was actuated manually, and the fire was extinguished in less than 1½ minutes. Proof that we are completely sold on Cardox is found in the fact that we have ordered an additional Cardox System to protect a new addition we are now building."

The danger spots in your plant may not be similar to the one described in File S-88. But, if they involve flammable liquids or electrical equipment of any kind, Cardox offers a new scope of protection—making fast-acting, non-damaging carbon dioxide available in *tons* for large fires—in *pounds* for small ones—with ample reserve for new emergencies.

Before fire strikes to endanger your vital production plans, find out how Cardox has broadened the performance scope of carbon dioxide to set a new high standard of protection for many of the most severe hazards in American industry. An analysis of your fire hazards by Cardox Research Division and Engineering Staff puts you under no obligation. Write for Bulletin 8 16.

**CARDOX CORPORATION**
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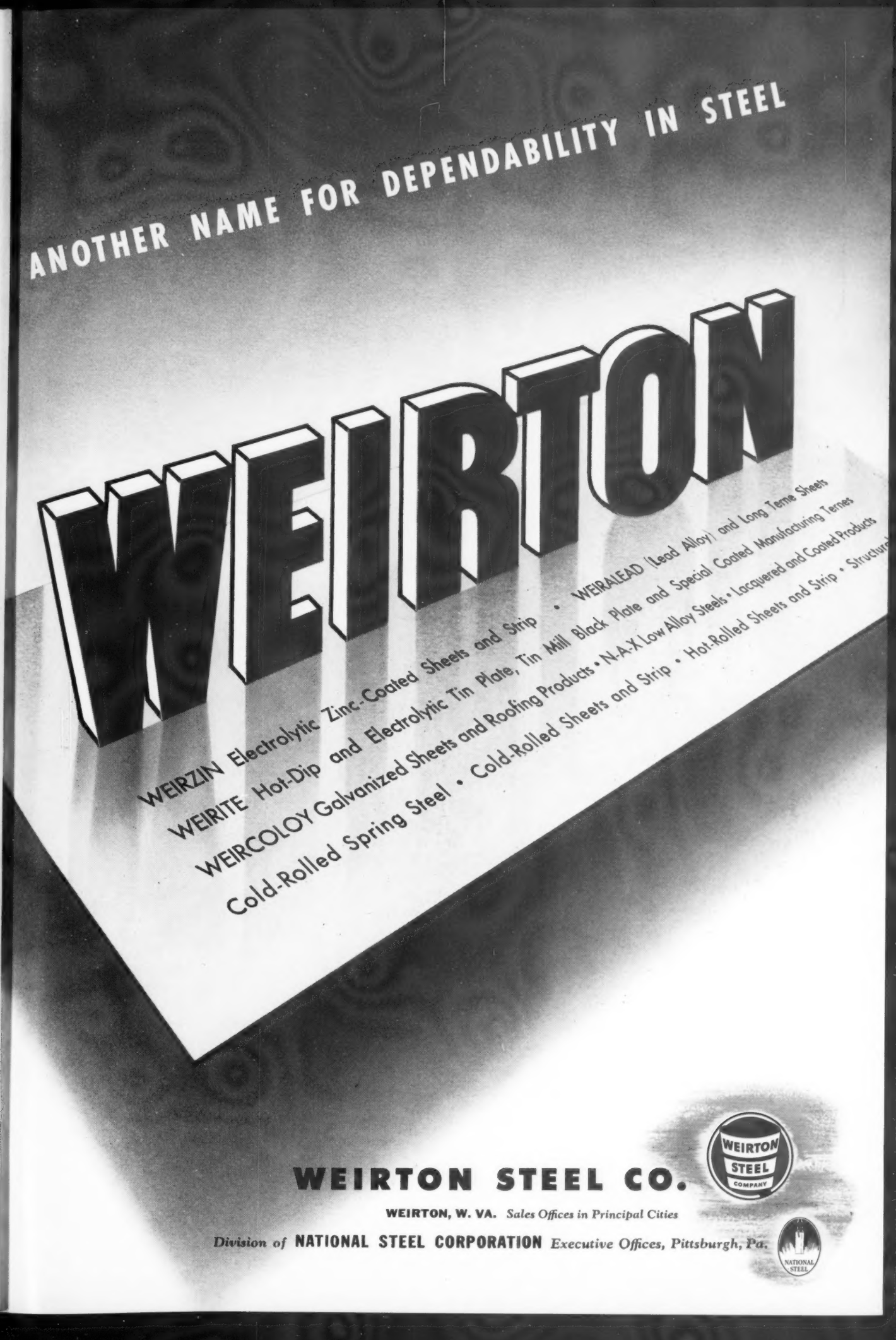
*District Offices in*
**New York, Washington, Detroit, Cleveland, San Francisco, Los Angeles, Pittsburgh, Seattle, Philadelphia, San Diego, Houston**

**Cardox $CO_2$ is supplied instantly in pounds or tons from a single Storage Unit containing 500 pounds to 125 tons at controlled low temperature of 0° F. and 300 p.s.i.**

**CARDOX**
**$CO_2$ FIRE EXTINGUISHING SYSTEMS**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WEIRZIN Electrolytic Zinc-Coated Sheets and Strip • WEIRALEAD (Lead Alloy) and Long Terne Sheets
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**From insect** extermination to rimming steel operations . . . from commercial laundry work to etching glass—General Chemical Sodium Fluoride and Sodium Bifluoride serve industry in many ways. Today, they are filling new roles, too, such as the use of Sodium Fluoride for public health research in the fluorination of domestic water supplies.

**Ahead lie** still other applications—perhaps one in your plant or process. If so, speed your investigations by contacting the nearest General Chemical office for pertinent product data as well as for technical service in adapting either of these fluorides to your needs.

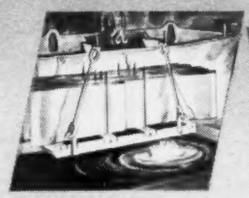
**These General Chemical** Fluorine Compounds are available from convenient shipping points in the following strengths and densities: Sodium Fluoride, White – Light or Dense, 90% and 95% NaF, also Nile Blue –Light, 95% NaF; Sodium Bifluoride, Powdered, 90% $NaHF_2$.

SODIUM FLUORIDE

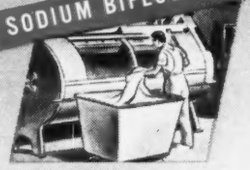
**RIMMING STEEL:** Used in pouring billets to insure a smooth rolled sheet

**WOOD PRESERVATIVE:** To prevent insect attack on structural and other materials

SODIUM BIFLUORIDE



**STAINLESS STEEL:** As a Hydrofluoric Acid substitute in pickling



**LAUNDRIES:** To neutralize excesses of soap and other alkaline detergents; to remove iron stains

**ENAMELWARE:** As a fluxing agent

**GLASS:** As an etching and frosting agent

**PEST EXTERMINATION:** As a vermin destroyer

**MAINTENANCE:** In cleaning stone and concrete surfaces

BASIC CHEMICALS

GENERAL CHEMICAL COMPANY

FOR AMERICAN INDUSTRY

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**40 Rector Street, New York 6, N. Y.**

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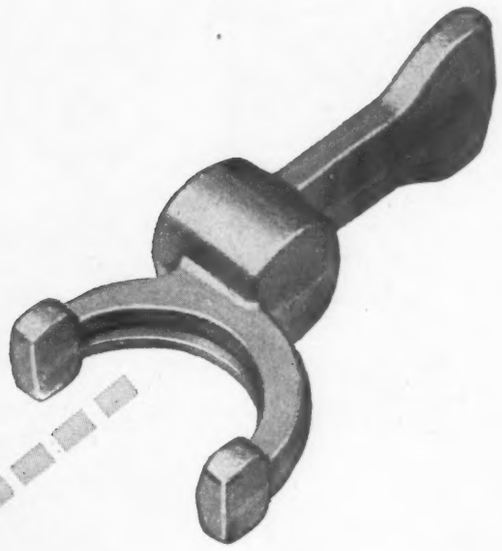
# The Improvement of Metals

**involves the development of metal quality in the exact degree required to meet a service condition**



*Reference Data Booklet presents many new ideas on forgings and their applications in many different types of equipment. Copies available to engineers, metallurgists and executives.*

## BY FORGING

Fortify your product with forgings to assure its dependable performance under unpredictable service conditions. Forgings offer you metal quality developed fully to meet a specific service condition, minimum scrap loss and reductions in the cost of machining and processing. With forgings you can achieve and maintain the correct relationship of quality and cost for a part. Recent developments in forging techniques and procedures, by which numerous so-called "impossible-to-forge" designs are being successfully forged, now make forgings practical for many more parts of simple or complex design. Consult a Steel Improvement Forging Engineer while parts are still in the design stage so that you may obtain the full benefits of over 32 years of forging production experience. Write for Technical Reference Data Booklet titled "The Improvement of Metals by Forging."

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**THE STEEL IMPROVEMENT & FORGE CO.**

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*Drop, upset and press forgings from one-half ounce to 500 pounds of carbon, alloy and stainless steels and non-ferrous metals.*

**WORCESTER PRESTEEL**

# Presteel Produces an Unusual Welded Flywheel

The flywheel shown here is an unusual stamped-welded assembly. It measures 7 inches in diameter, and must be filled with mercury before installation to provide the desired weight.

As the sectional view shows, the assembly is made up from several drawn shapes and requires both spot and autogenous welding to insure a mercury-tight closure. Presteel then precision-grinds the O.D. and end faces to provide perfect balance.

Such work requires more than ordinary press experience, making it "A Job for Presteel."

As you look forward to your future stamping problems which require skill and ingenuity plus unusual stamping facilities, think of Presteel.

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ALLOY STEELS AND OTHER METALS COLD FASHIONED SINCE 1883

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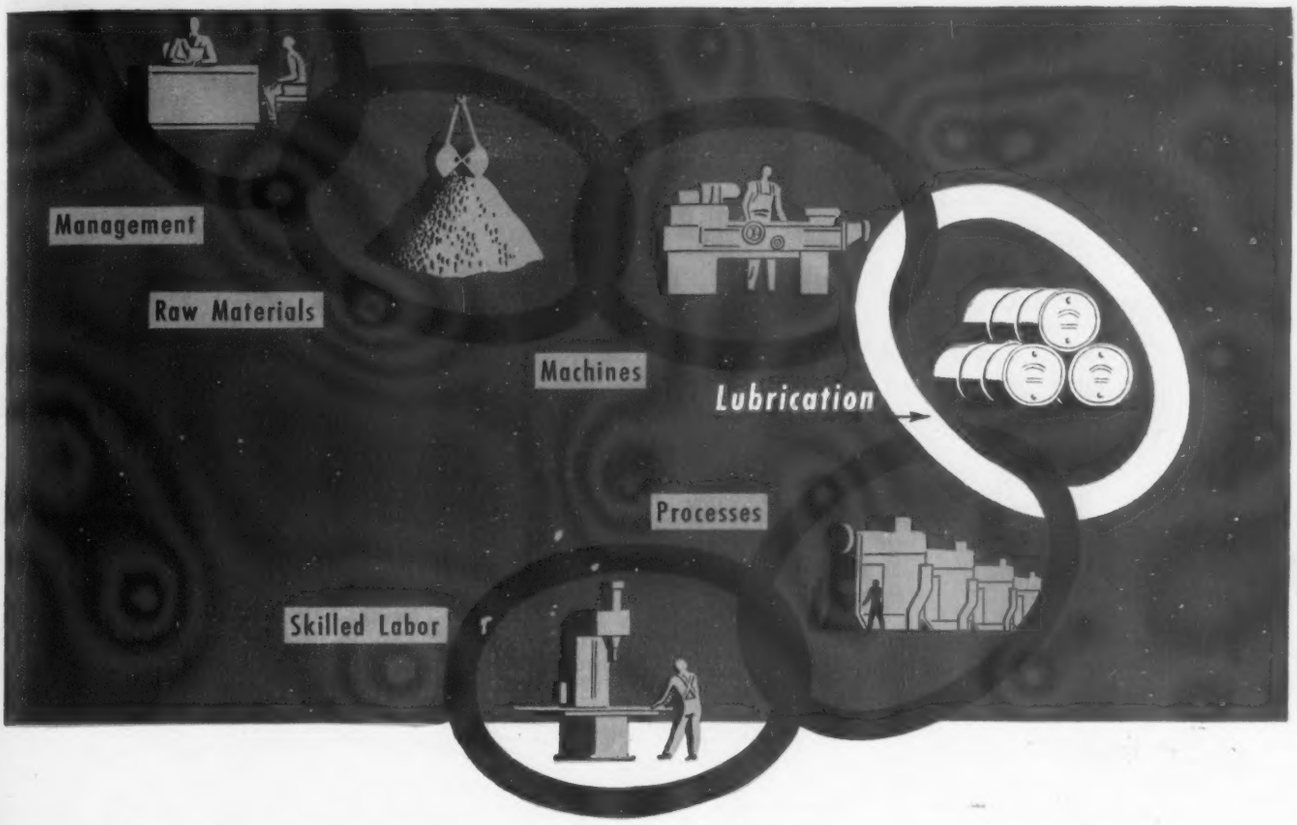
*Representatives in Alexandria Virginia, Buffalo, Canton Ohio, Chicago, Denver, Detroit, Fort Worth, Indianapolis, Los Angeles, New York, Philadelphia, Syracuse, Toronto*




# For higher output, lower costs— strengthen this vital production link with Gulf Quality Lubricants

IN your continuing effort to increase output and reduce costs, don't overlook the importance of lubrication as a vital link in the production chain!

Have you talked with a Gulf Lubrication Engineer recently about the possibility of making further improvements in production efficiency through better selection and use of oils and greases? He is familiar with many recent developments, has had broad practical experience, and can help you cash in on the many benefits that can be obtained through modern petroleum science and lubrication practice.

There is a Gulf quality lubricant which will insure minimum wear for every gear, bearing, and moving part in your plant—that will help you improve production and reduce maintenance costs! Call in a Gulf Lubrication Engineer today and ask him to recommend the oils and greases best suited to your needs. Write, wire, or phone your nearest Gulf office.

**Gulf Oil Corporation · Gulf Refining Company, Gulf Building, Pittsburgh, Pa.**
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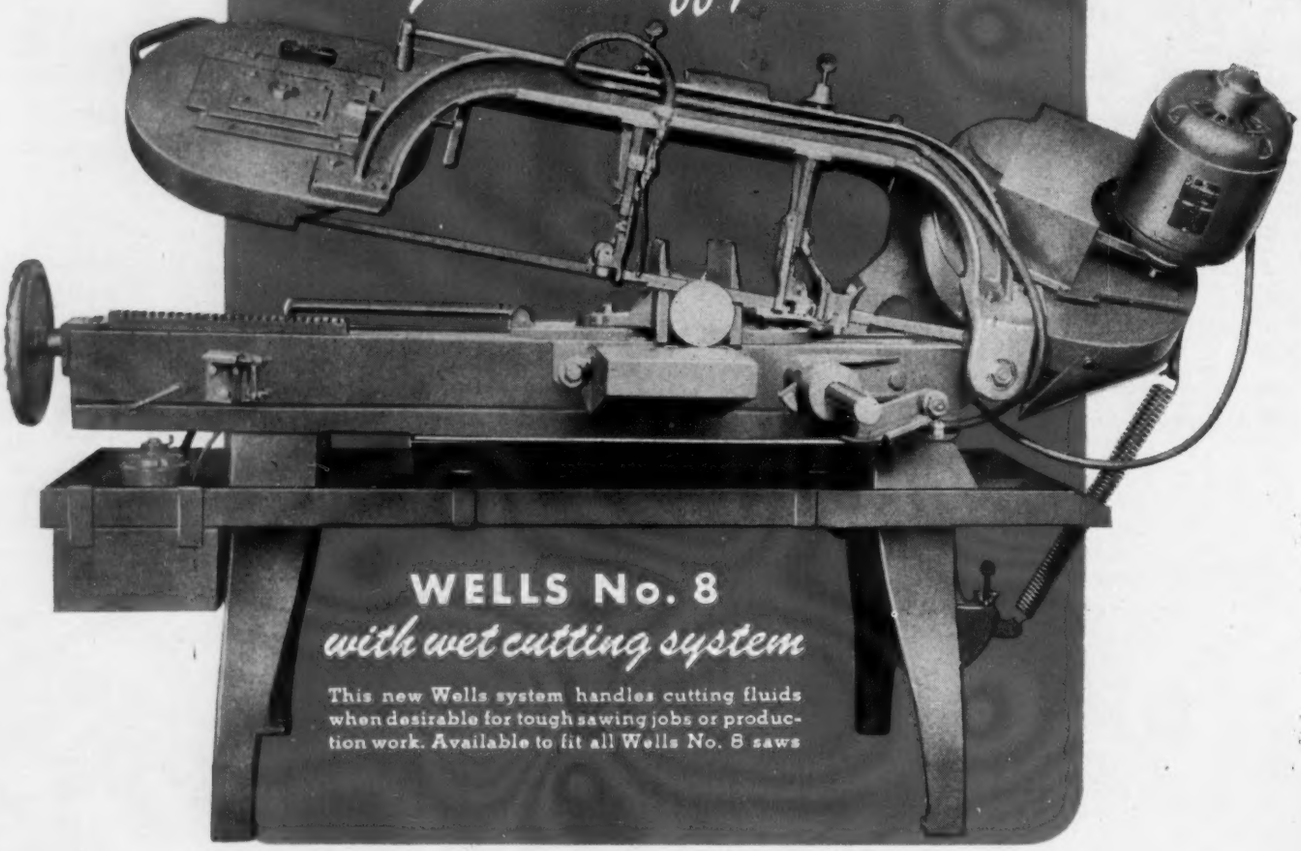
GULF INDUSTRIAL LUBRICATION

More than 400 quality oils and greases for industry

. . . the labor-saving, time-saving **Wells** . . .
*a low cost solution to your cut-off problems*



**WELLS No. 8**
*with wet cutting system*

This new Wells system handles cutting fluids when desirable for tough sawing jobs or production work. Available to fit all Wells No. 8 saws

YOU WON'T find a better answer to all-around metal sawing problems than a versatile Wells. On miscellaneous cut-off jobs around the plant, or on steady production work, they can always be kept busy. ¶ A portable Wells will pay for itself quickly in your plant. Ask to see one in operation. Write for full details—or invite a representative to visit you.

Wells saws

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*Products by Wells are Practical*

**METAL CUTTING BAND SAWS**

**WELLS MANUFACTURING CORPORATION**
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*For*

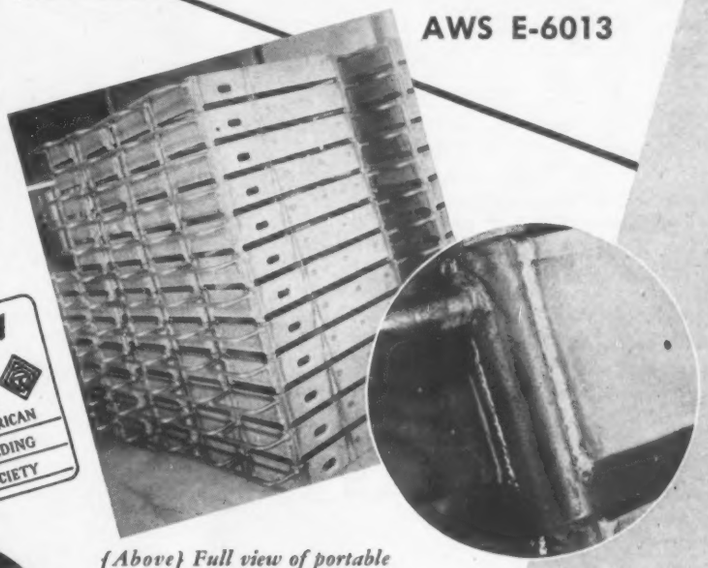
## HIGHLY SATISFACTORY WELDS OF THIN GAUGE METAL USE *the* CHAMPION

# NEW GRAYDAC ELECTRODE

AWS E-6013

EXCELLENTLY adapted to thin gauge metal, ***GRAYDAC*** Electrode provides just sufficient penetration to make a good bond which allows for grinding flush without weakening the weld. On vertical down the bead is flat and exceptionally smooth. Spatter is held to a minimum and slag easy to remove.

Competitive tests showed ***GRAYDAC*** superior in bead appearance, penetration, ease of starting, vertical performance and all 'round handling. ***GRAYDAC*** is especially recommended for use with the low input type of Transformer Welding Machine.



*{Above} Full view of portable machine bases and close up view of corner weld made with* ***CHAMPION GRAYDAC Electrodes.***

*{Above} Full view of bases for meat cutting machines and close up of corner weld made with* ***CHAMPION GRAYDAC Electrodes.***

JOIN The AMERICAN WELDING SOCIETY

## APPLICATIONS

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| Auto Body Panels | Sheet Metal Work |
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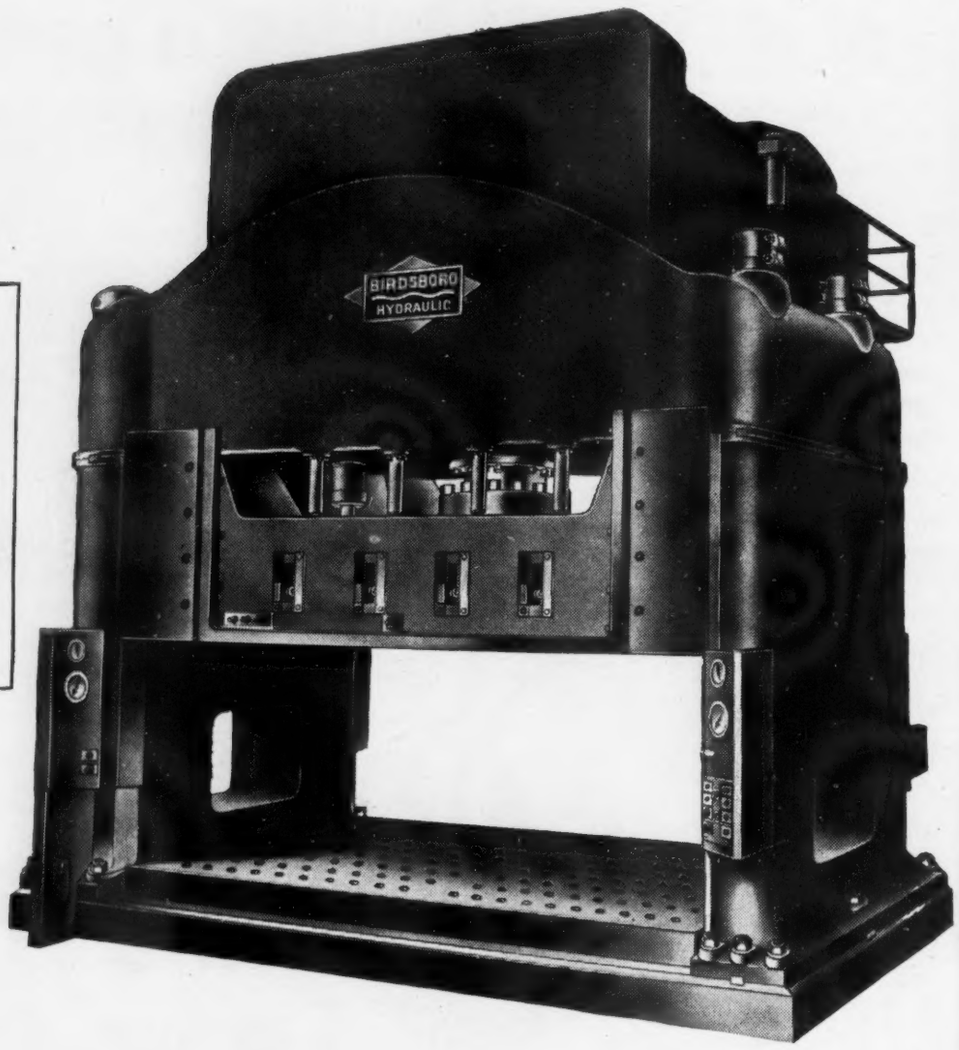
# NEW HYDRAULIC METAL STAMPING PRESS

This new Birdsboro press has been designed and engineered to incorporate many new features to produce metal stampings faster, more accurately, according to the most modern methods.

For more detailed information or for help in solving your press problems, call for a Birdsboro engineer today.




HYDRAULIC SINGLE ACTION DEEP DRAW SHEET METAL PRESS — HOUSING AND SHRUNK TIE ROD TYPE WITH HYDRO-PNEUMATIC CUSHION IN BED

- 500 ton main ram capacity
- 180 ton cushion capacity
- Working area: 144" right to left; 60" front to back
- Daylight opening—60"
- 125 H.P. motor
- 20' overall height above floor

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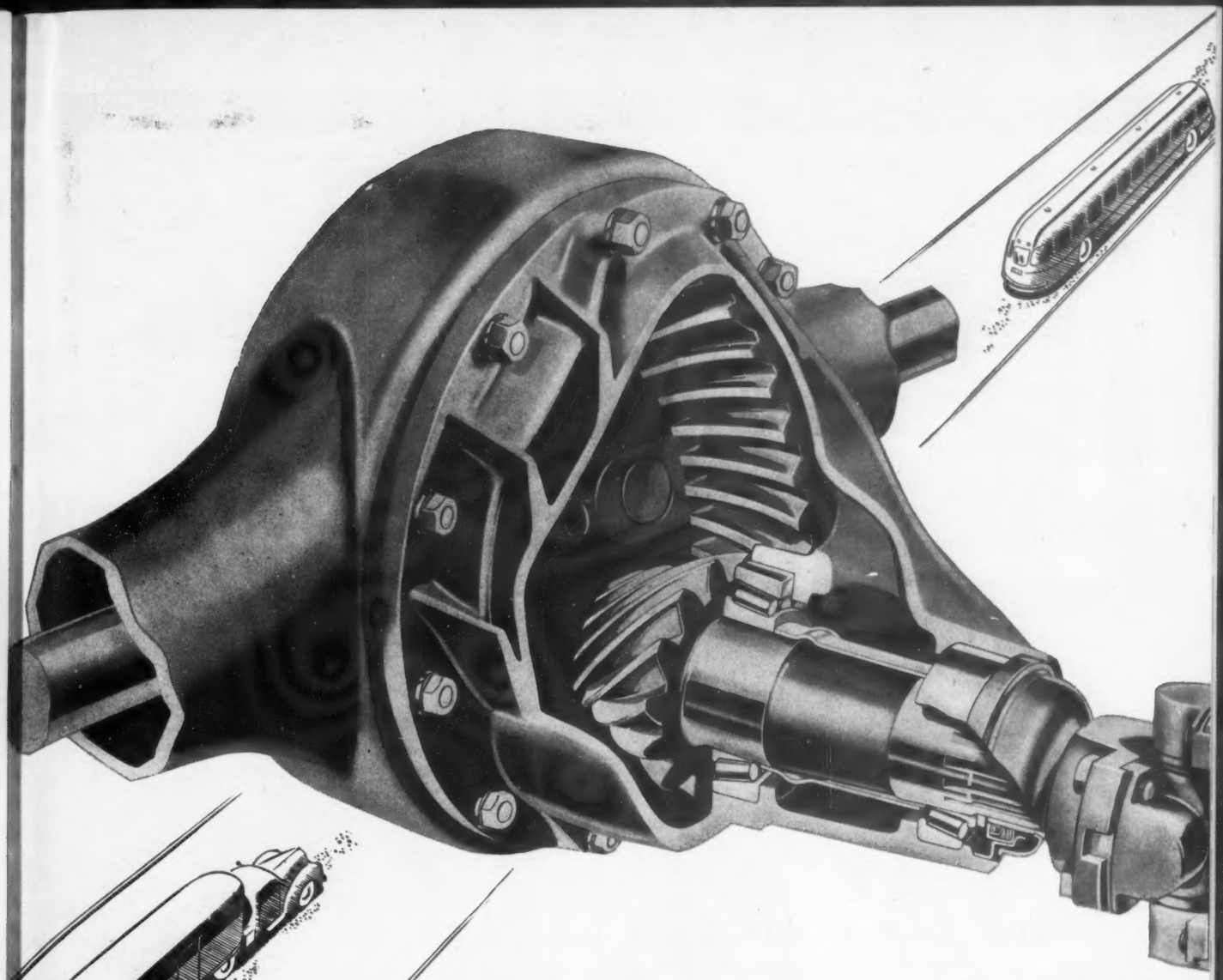

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## WITH CARBURIZED GEARS, CAMS AND SHAFTS OF

# CHROMIUM VANADIUM STEEL AISI A 6120

The excellent properties developed by AISI A 6120 Chromium Vanadium Steel in carburizing applications provide superior performance for such vital parts as gears, cams, shafts and bearings, in which a case of exceptional strength and hardness must be strongly bonded to a tough, ductile core.

These desirable characteristics are imparted to A 6120 carburizing steel by a simple direct quenching and tempering treatment.

Our metallurgists will be glad to work with you in the application of carburizing steels to meet your particular requirements.

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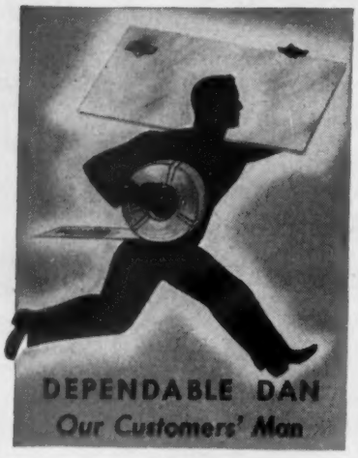


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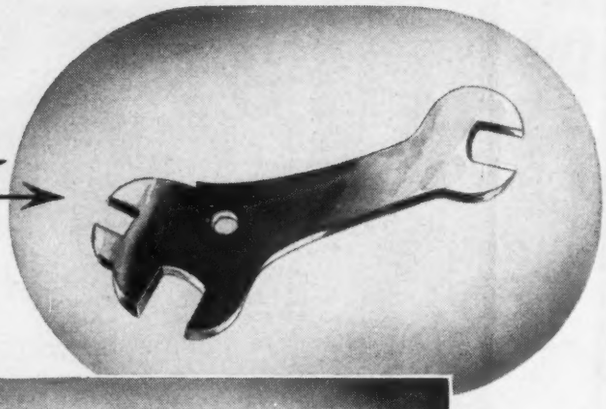
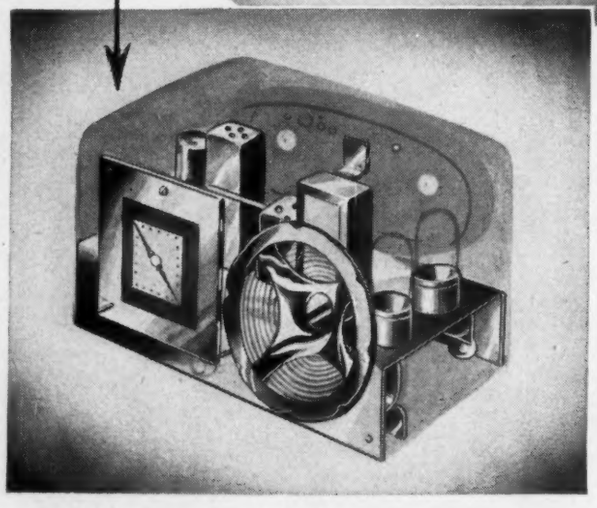
FROM *Wrenches* TO *Radios*





## Sheet and Strip Steel . . . JOB FITTED TO YOUR PRODUCT

When Reliance Job-Fitted Steel goes into your product, it gives up its own identity but in doing so, it imparts strength, beauty, serviceability and endurance. It makes for speedy, smooth production at low cost.

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*Detroit Steel Corporation*

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FOR those who expect the desired benefits, a pair of spectacles is no stock item to be purchased from a catalog. Rather, the aid of an oculist is sought—a specialist who first determines your needs, then prescribes lenses to suit your *individual requirements.*

Likewise in production heat treating, where plant conditions are as varied as human eyes, the furnace must be "prescribed" to meet the conditions of the particular plant in order to obtain best results. That's why every Holcroft furnace is *designed individually for the job.*

First, an experienced Holcroft furnace engineer confers with your own engineers to obtain all information pertinent to your problem from both the metallurgical and plant-operating standpoint. Then the Holcroft engineering staff—*unbiased* as to any one fuel or type of mechanism—designs the installation, selecting those features which the conditions of the job demand. The result is a furnace exactly fitted to your own individual plant, meeting all production requirements with maximum operating economy.

Before you order a heat treat furnace for production work of *any* type, we urge you to discuss your problem with Holcroft —without obligation on your part.

ELECTRIC AND COMBUSTION *Furnaces*

BUILT BY HOLCROFT & COMPANY DETROIT-MICH.

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**Holcroft AND COMPANY**

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CHICAGO 3: C. H. MARTIN, 1017 PEOPLES GAS BLDG. • HOUSTON 1: R. E. McARDLE, 5724 NAVIGATION BLVD.
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# helps to a healthy future

- **FOR YOU**
- **FOR YOUR COMPANY**
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A booklet for employees . . . explaining graphically how the payroll savings plan works . . . goals to save for, and how to reach them with Saving Bonds.

## *OFFICIAL APPOINTMENT—*

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A booklet, published for key executives by the Treasury Department, containing helpful suggestions on the conduct of your payroll savings plan for U.S. Savings Bonds.

### Are You Using These Booklets?

If you're not already using these helps to a healthy future, get in touch with your State Director of the Treasury Department Savings Bonds Division. And by all means keep up your payroll savings plan. It's a powerful weapon for the maintenance of a strong, secure economy — today and tomorrow!

---

*The Treasury Department acknowledges with appreciation the publication of this message by*

**STEEL**

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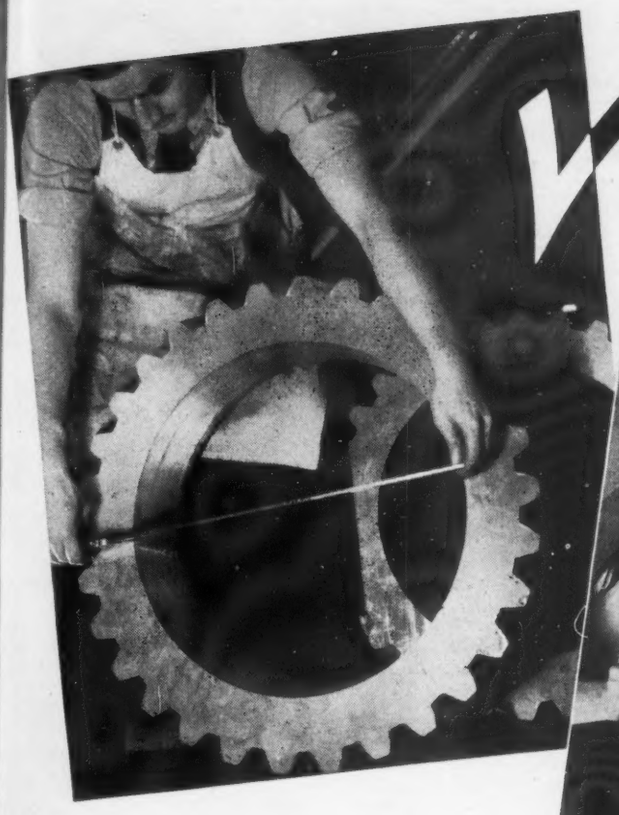
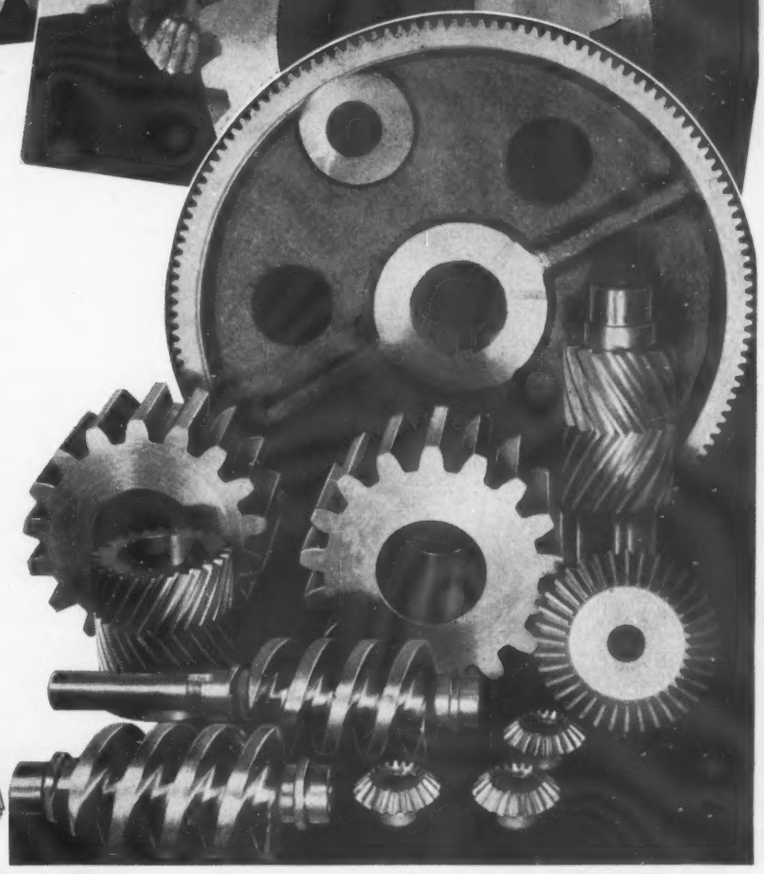
# CHECKED and DOUBLE CHECKED



## ... at every step FOR YOUR PROTECTION

Regardless of size, type or quantity, all gears made by "Phillie" are subjected to the same unrelenting "checking and double checking,"—for as our Founder wisely said many years ago: "Gears that aren't absolutely correct, are as useless as no gears at all." For over 54 years, we've been making gears and geared products. On top of that, our present facilities are the "last word" in gear making machinery. Send for your copy of the famous "Gear Book" No. 45 (it's practically a "text book" on gears,—and please use your Business Letterhead when writing for it).



**Philadelphia**
**GEAR WORKS INCORPORATED**
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Automatic charging of Keokuk electric furnace in the manufacture of silvery pig iron.

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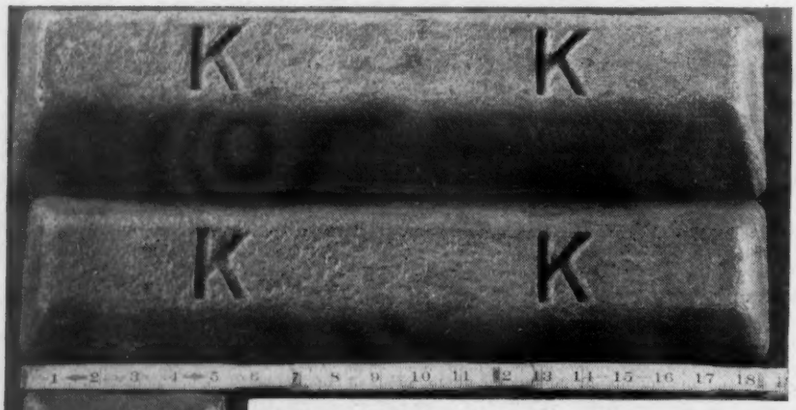
Because it is specially processed in the electric furnace, Keokuk Electro-Silvery has all the advantages of complete and constant control. The result is uniformity and high quality. Write today for full information and prices.



# Keokuk Electro-Silvery

*Keokuk Electro-Silvery . . . both standard and alloy . . . 60-lb. pigs for blocking the open hearth heat—30-lb. pigs for charging the cupola—12½-lb piglets (for foundries) so uniform in weight that they can be charged by count. All can be handled by magnet.*

**KEOKUK ELECTRO-METALS COMPANY**

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*For over 30 years . . . Electro-Silvery and other Ferro-Alloys*

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# w to improve your LLING METHODS

## with SUNDSTRAND ENGINEERED PRODUCTION

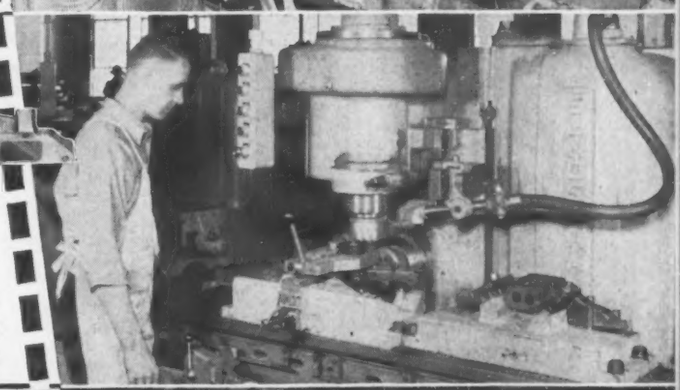
There are two basic approaches to solving milling production problems: (1) obtaining standard machines, then trying to process parts over these machines as economically as possible, (2) designing the most profitable processing method, then obtaining machines to suit this method — standard or semi-standard machines if possible, or entirely special machines, if necessary.

This latter method is Sundstrand "Engineered Production" . . . a most practical approach to economical milling. Here's how it has been applied in three different plants on 3 different milling problems.

### STANDARD RIGIDMILS WITH FIXTURES AND TOOLING TO SUIT YOUR WORK

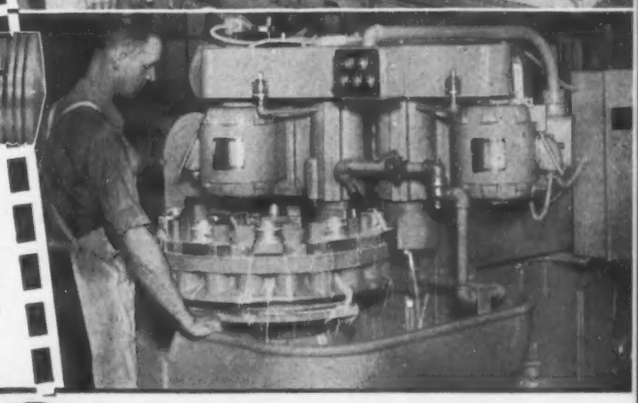
ddle milling three lugs on a ch plate. This operation was y performed using a hand table, a time consuming ome operation. A standundstrand No. 1 Rigidmil a standard Sundstrand automatic index base provides full automatic cycle except for loading, unloading and the initial cycle start. Production is increased and operator's duties simplified with this new setup.

### TANDARD RIGIDMILS WITH SPECIAL HEADS AND TOOLING



ling three surfaces of a mani- l on a standard Sunstrand lel 33 Fluid-Screw Rigidmil. machine is equipped with a ular horizontal spindle and a cial vertical spindle. Each ndle carries one T. C. tipped cutter. The table cycle is automatic so the operator can load at one fixture while another part is being milled in opposite fixture. Both heads are adjustable so that a wide range of work can be accommodated at any time.

### ENTIRELY SPECIAL MACHINES



Sawing two slots and mill- the radius in skirt of piston gs. This special 3 spindle ndstrand milling machine util- two vertical spindles each of ich saws one slot in skirt of ton. The horizontal spindle ries one cutter which mills the radius in the end of skirt. Ten individual fixtures are mounted on the rotary table. Each fixture locates and holds one piston which is automatically clamped as the piston approaches the cutters and unclamps after the cut. Production is approximately 1200 pieces per hour.

## FREE-

re proof of the successful applications of Sund- nd "Engineered" milling production is contained this book. Over 60 problem solutions complete h tooling diagrams are included. Write for your y today. Ask for bulletin No. 752.

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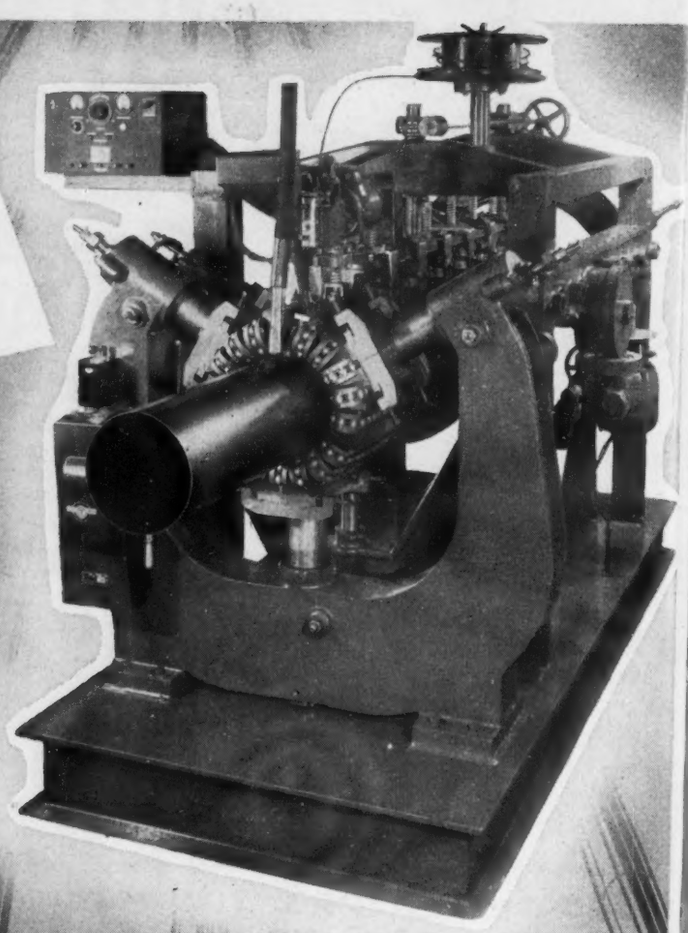
# Lower Costs . . . . Continuous Welds with the Berkeley



To speed up your welding production of pre-formed tubes there's no substitute for the Berkeley Continuous Longitudinal Seam Welder. You'll get welding speeds up to 250" per minute . . . not for one welding job, but all day long. Will weld the seams of rounds, squares and a variety of shapes if they have a constant cross section and are 5" to 36" in dia. The Berkeley is used in combination with the automatic submerged electric arc.

*Write for details*

## PENN TOOL & MACHINE CO.

DANVILLE, ILLINOIS

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# NEUTRALIZES ACIDS
# *that Speed Up Rusting*

**Every maintenance engineer knows** that Red Lead has long been the outstanding protective paint for metal.

**But did you know** that one of the important reasons is the ability of Red Lead to counteract the acid conditions which are recognized as accelerators of rust?

**Structural steel** is usually exposed to acid environments. This is so because acid-forming compounds are produced by certain gasses and smoke in contact with moisture. Pollution of waterways also results in acidity.

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**The value of Red Lead** as a rust preventive is most fully realized in a paint where it is the only pigment used. However, its rust-resistant properties are so pronounced that it also improves any multiple pigment paint. No matter what price you pay, you'll get a better paint for surface protection of metal if it contains Red Lead.

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**Write for New Booklet**—"*Red Lead in Corrosion Resistant Paints*" is an up-to-date, authoritative guide for those responsible for specifying and formulating paint for structural iron and steel. It describes in detail the scientific reasons why Red Lead gives superior protection. It also includes typical specification formulas. If you haven't received your copy, address nearest branch listed below.

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**Dutch Boy**
**Red Lead**

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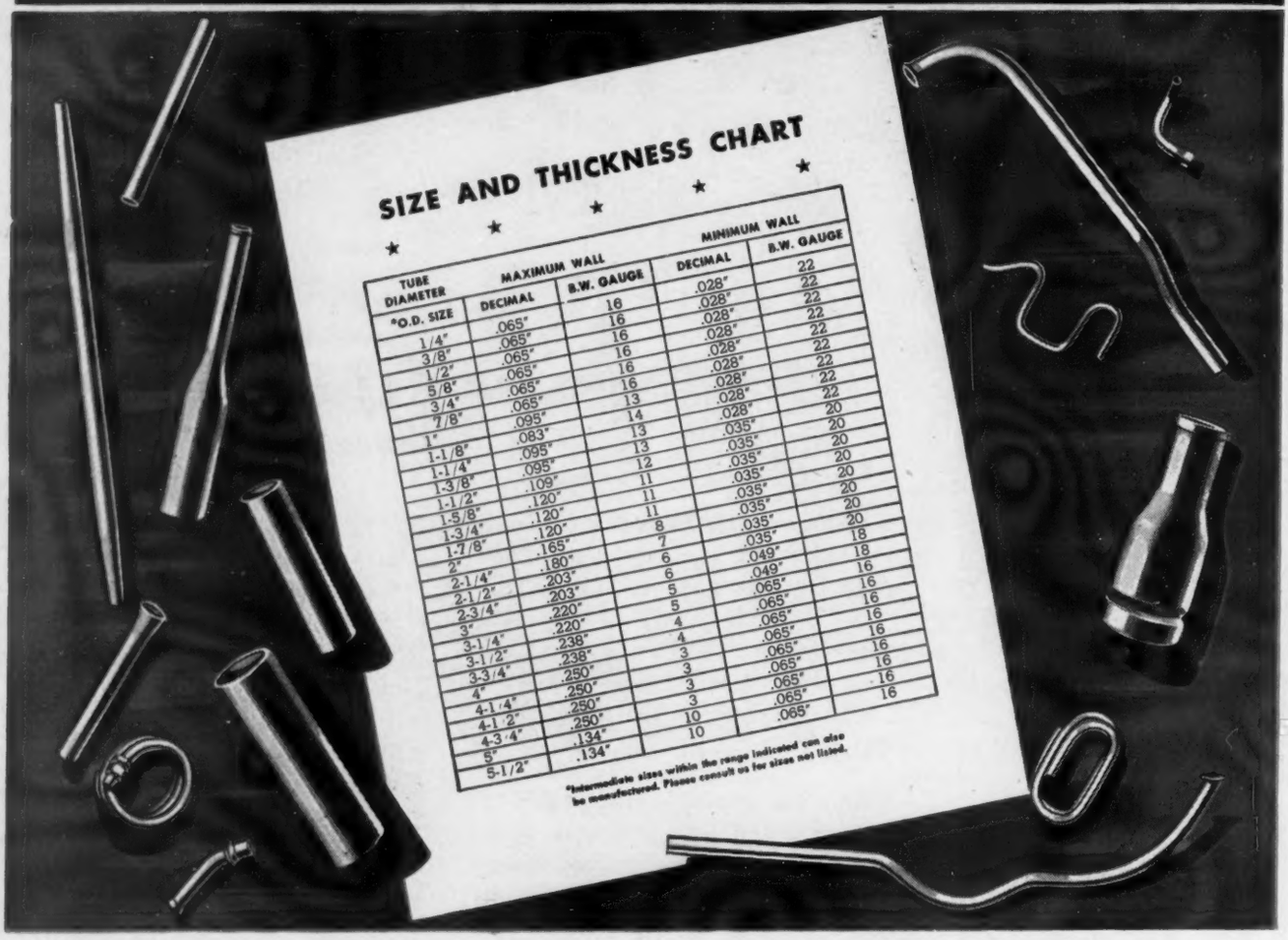


With every year that passes, more and more manufacturers of products calling for ELECTRIC WELDED STEEL TUBING are discovering the advantages of specifying the "Standard" brand. They find that our wide variety of shapes and sizes, plus our facilities for high speed production afford them the means of getting the kind of tubing they want—when they want it. And they find that our interested and willing cooperation in the solving of special tubing problems helps them make their products quicker and at lower cost. These same advantages are available to you. If you are looking for a source of high quality ELECTRIC WELDED STEEL TUBING it will pay you to investigate our experience and facilities.

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Detroit 3, Michigan

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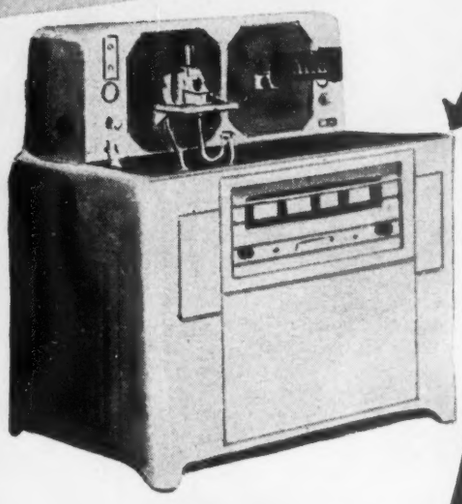

# *Modernize*

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# *with Surplus*

## INDUCTION EQUIPMENT

If your production calls for the hardening, brazing, annealing or heating of metal parts here is the opportunity of a lifetime. A large quantity of Tocco induction heating equipment is available as surplus—for immediate disposal. The equipment is both used and unused and is price-tagged to sell quickly.
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To War Assets Administration: Without obligation, please send me information on the cost and location of Induction Heating Equipment of the following type.

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Firm_____

Address_____

City_____ State_____

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700-1

# The Lathe with a Big "BAG OF TRICKS"

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L & S LATHES

CINCINNATI 25, OHIO

MACHINE TOOL DIVISION 3055 COLERAIN AVE. • SPECIAL PRODUCTS DIVISION 800 EVANS ST.

# American Airlines had a shielding problem "American Metal Hose" *found the answer*

**THE PROBLEM:**

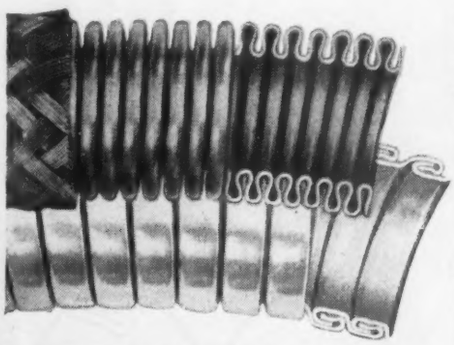
Ever since high frequency radio had been installed in aircraft, adequate ignition shielding had been a problem—fatigue cracking of the flexible metal shielding caused by continual vibration; moisture penetration of the conduit, causing electrical leakage and resulting in ignition failure, interrupted radio communication and schedule delays.

**THE SOLUTION:**

The answer to these difficulties was provided by the HTCD Shielding Conduit developed by the American Metal Hose Branch of The American Brass Company. Here is a strong, tough, corrosion and vibration-resistant, moisture-proof flexible metal tubing constructed of interlocked stainless steel core, with a covering of two specially-woven layers of tinned copper wire braiding, with brass ferrules, stainless steel nuts, and, finally, a molded Neoprene jacket.

**THE RESULT:**

American Airlines' flight-testing of this new shielding conduit revealed electrical characteristics never before approached in practice. After 3,712 hours and 42 minutes of operation, the conduit was in such excellent condition that tests were discontinued and it was accepted as standard. In addition, detailed cost studies revealed that the new shielding conduit cost approximately *half as much* per hour of operation as that previously used—and its ultimate life is still unknown. 46847



*For practical industrial applications of American Seamless Flexible Metal Tubing and Interlocked Flexible Metal Hose, illustrated above, write for Publication SS-50.*

ANACONDA

*American Metal Hose*

**THE AMERICAN BRASS COMPANY**

***AMERICAN METAL HOSE BRANCH***

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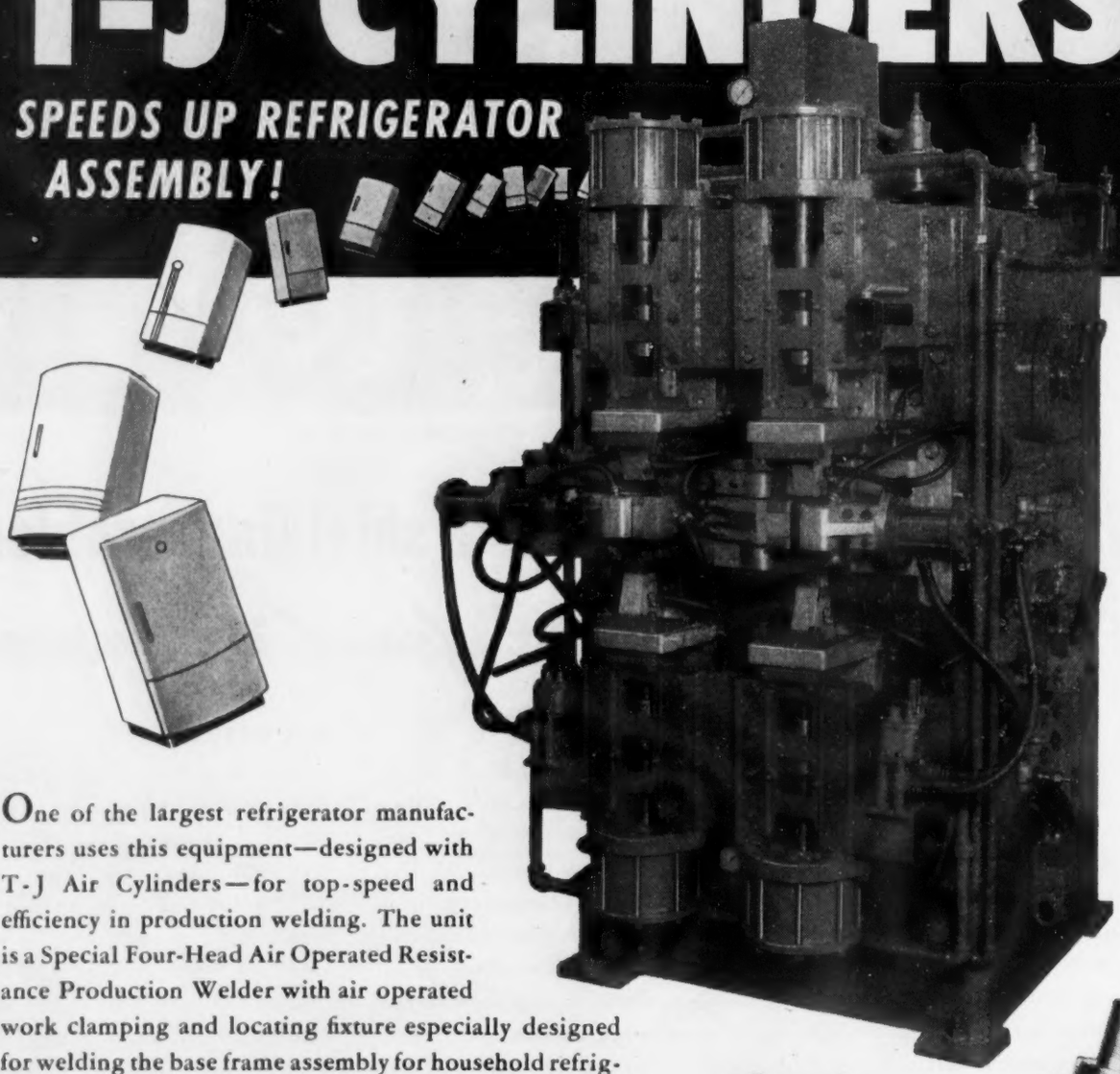
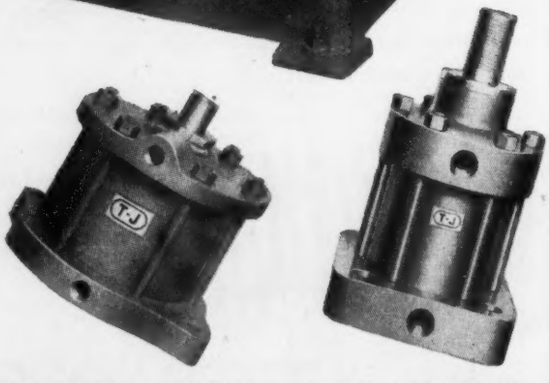
# Production Welder with T-J CYLINDERS

## SPEEDS UP REFRIGERATOR ASSEMBLY!

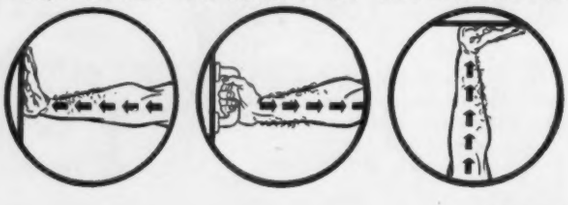


One of the largest refrigerator manufacturers uses this equipment—designed with T-J Air Cylinders—for top-speed and efficiency in production welding. The unit is a Special Four-Head Air Operated Resistance Production Welder with air operated work clamping and locating fixture especially designed for welding the base frame assembly for household refrigerators. The equipment is manufactured by National Electric Welding Machines Co., Bay City, Michigan.

More and more today—industry is harnessing T-J Air and Hydraulic Cylinders to operations of all kinds where pushing, pulling, lifting or mechanical control is needed. Available in many standard sizes and styles . . . both cushioned and non-cushioned types. T-J Engineered to do the job *right!* Write for latest catalogs. The Tomkins-Johnson Co., Jackson, Michigan.



**FOR POWER MOVEMENT IN ANY DIRECTION**



**TOMKINS-JOHNSON**

RIVITORS...AIR AND HYDRAULIC CYLINDERS...CUTTERS...CLINCHORS

T-J

# NEED STEEL?

*Here's the way to get it*

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Flame-cutting is a fast and economical way to reduce steel to pieces of the right size for charging into furnaces for the production of new steel. Line up a scrapping program *now*—we will be glad to help. Just call the nearest Linde office.

**THE LINDE AIR PRODUCTS COMPANY**

*Unit of Union Carbide and Carbon Corporation*

30 E. 42nd St., New York 17, N. Y. UCC Offices in Other Principal Cities

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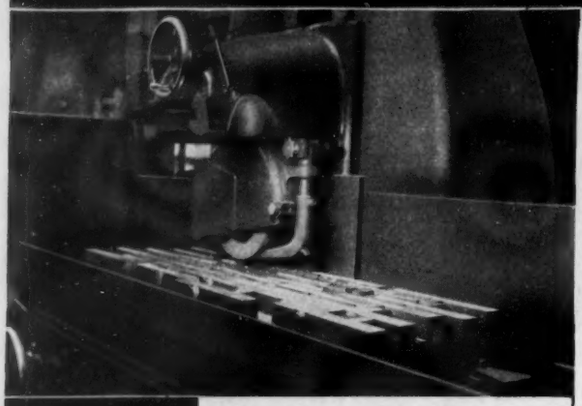
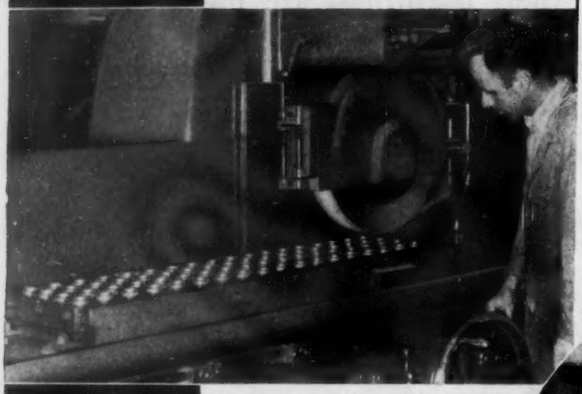
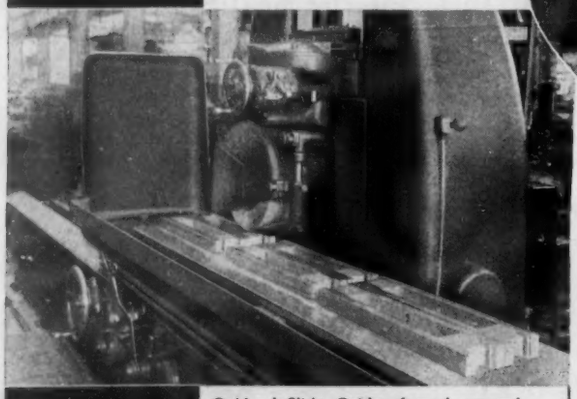
# LARGE TABLE SPACE MEANS MORE PIECES PER LOAD AND GREATER PRODUCTION *with the Mattison Grinder*



● Cross Slide Draw Bars formerly ground 5 pieces at a time. Now ground on a Mattison Grinder 27 pieces per load. 50% time saving.



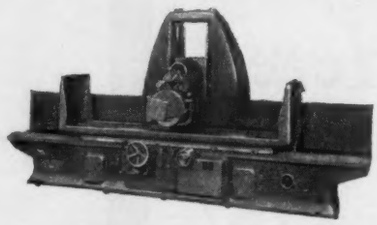
● Caps previously ground few at a time on small grinder. Now, Mattison Grinder handles 75 at a time. Time was reduced from 7 hours to 30 minutes.

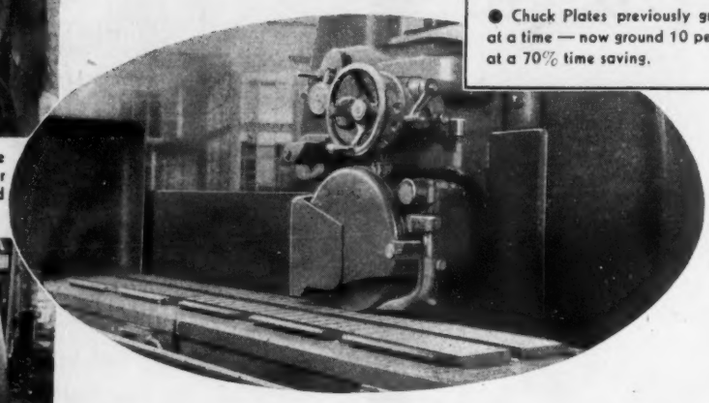


● Head Slide Guides formerly ground one at a time in 36 minutes — Now ground on a Mattison Grinder 9 pieces per set-up at a 77% time saving.

**Examples:** Grinding 75 pieces per load instead of 18 — cut time 80% . . . . . 10 pieces per load instead of 2 — cut time 70%, etc.

Jobs shown indicate the possibilities for increased production by handling large quantities per set-up. In your efforts to obtain maximum production and lower cost, it will pay you to check into the capabilities of the Mattison Grinder.





● Chuck Plates previously ground 1 at a time — now ground 10 per set-up at a 70% time saving.

## ADDITIONAL INFORMATION

Also available is free Set-Up Book showing further examples of work ground on Mattison Grinders — Send for a copy today.

**MATTISON MACHINE WORKS**

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That means designers and engineers can use these rustless alloys in complicated shapes which frequently were not practical or economical to obtain as sand castings or by machining from forged stock.

The illustration shows the flexible design possible. Note the holes, slots, undercuts, vanes, wing sections, gear teeth and threaded sections that can be produced with hair-tolerances and fine finish . . . *without machining or grinding.*

Both manufacturers and users profit by this development. To the *manufacturer,* it means a chance to use INCO Nickel Alloys in more economical forms. To the *user,* it means broader protection against stress . . . corrosion . . . erosion . . . high temperatures . . . abrasion.

**The International Nickel Company, Inc., 67 Wall St., New York 5, N.Y.**

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Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $6; two years $10; all other countries, one year $12. Single copies (current issues) 25c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.


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# STEEL

*The Magazine of Metalworking and Metalproducing*

VOL. 119, NO. 10 SEPTEMBER 2, 1946


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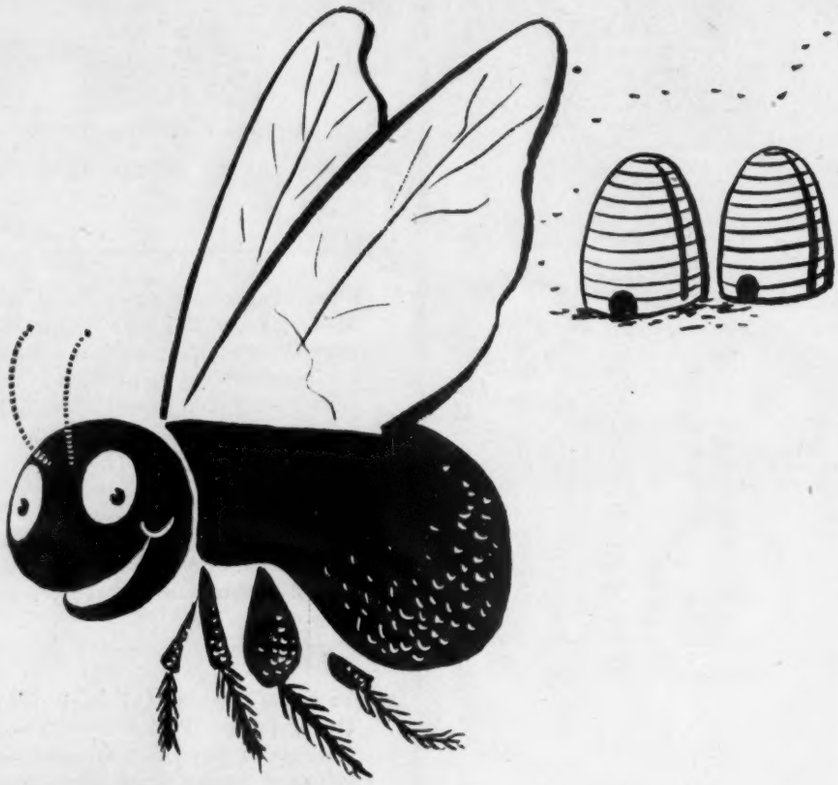
Determining Selling Prices for Industrial Products
Heat Treating Aluminum—Annealing Practices



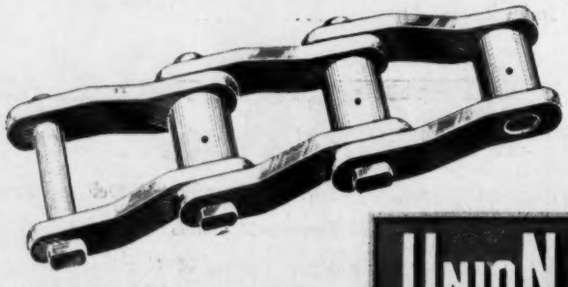
# B for BUSY...

*Busy doing what? Busy making honey, of course. An unmitigated specialist, the bee. Honey and honey alone is its line, and in its line it's a terrific perfectionist.*

## SPROCKET CHAINS...
### *and Sprocket Chains Alone Are Our Business*

What we don't know about making honey would fill a shelf of books. What we do know about making sprocket chains would fill the same shelf. That's all we do—make sprocket chains. We're specialists—and even, we like to think, perfectionists. So it's natural that when a manufacturer has decided upon economical, efficient, trouble-free sprocket chains to solve his problems in power transmission or materials handling, he brings those problems to us at Union Chain.

**The Union Chain and Manufacturing Company - Sandusky, Ohio**



Union HB Offset Sidebar Roller Chain is manufactured in a complete range of strengths and in sizes from 1½" to 6" pitch. Recommended for heavy duty drives.

**UNION CHAINS**

**Union Chains for Every Application**

**Drive and Conveying Chains and Sprockets**
- Bridge Chain
- Combination Malleable Iron and Steel Chain
- HB (hardened bearing) type chain
- BP (bar and pin) type chain

★

**Finished Steel Roller Chains and Sprockets**
- All manufacturer's standard, size ⅜ in. to 2½ in. pitch
- Single and Multiple Strands
- Extended Pitch Series in sizes 1¼ in. to 4 in. pitch

★

**Silent Chain and Sprockets**
- All sizes ⅜ in. to 1½ in. pitch

★

**Flexible Couplings**
- Roller chain type
- Silent chain type

# Prudent Preparedness

## As the EDITOR VIEWS the NEWS

Tension in international relations towers above domestic issues in almost every nation. Friction at points in Korea, Manchuria, China, India, Iran, Iraq, Palestine, Turkey, Bulgaria, Greece, Yugoslavia, Italy, Austria and Germany—coupled with the deterioration of the Paris Conference into a sordid spectacle of name-calling—is causing thinking people to pause in their work of reconversion and to alert themselves to new dangers ahead.

These dangers do not necessarily mean war. The people of no nation want war. None has the resources with which to win an early or decisive victory. It would be folly for any nation to deliberately provoke war at this time.

Nevertheless, reckless leaders are taking terrific chances. Emboldened by the memory of policies of appeasement pursued by Western Nations when Mussolini, Hitler and Hirohito were on the make, Russia and her satellites seem to be trying to see how far they can go before their encroachments are challenged.

Our only safe answer to these feelers must be a prompt and unequivocal stand against unwarranted demands. To compromise or evade now—as we did in the Panay, Ethiopia and Saar incidents before World War II—is to make World War III inevitable.

To register this firm stand will take more than stern words from our State Department. It will require a drastic reshaping of national affairs.

First, we must recognize the expanded responsibilities of the State Department and act quickly to build it up to the requirements of the times. Ambassadors and consuls in trouble spots should be given more facilities. They should be freed of archaic red tape.

Secondly, the national budget should be revised drastically. Pare down the appropriations for fancy activities in the Commerce, Labor, Agriculture and other departments and earmark this money for the State Department and for military forces abroad.

Third, correct the mistake we made in demobilizing our armed services too rapidly. Give our commanding officers in Tokyo, Seoul, Berlin, Frankfurt and Vienna enough men so they can stop worrying about high turnover and inexperienced personnel.

Fourth, scrutinize the equipment and supplies American industry is manufacturing for foreign account under government directives. Hold up questionable shipments until the recipient nations clarify their positions to our satisfaction.

Finally, cultivate clear perspectives. The public should know that today a diplomatic error in Europe or Asia is a more serious threat to the prosperity of Flint, Allentown, Dayton or East St. Louis than most of the problems that confront us on the home front.



**STEADY WORK AHEAD?** Prior to the war, Labor day was an unofficial dividing line between summer vacations and the fall working period. Employees who took vacations were back on their jobs by early September, refreshed and prepared to work steadily until the year-end holidays.

Labor day 1946 should be more significant in this respect than any of its predecessors. For one thing, the past summer was the first since 1941 in which the nation was not at war. Many persons who had skimped on vacations for four years made up for lost time by taking extended pleasure trips this summer. Another important point is that this year vacations with pay were enjoyed by millions of employees who heretofore had taken time off only if they could afford to miss their paychecks for a week or two. The experience was so attractive to some that in addition to taking their with-pay vacations, they remained away another week or two without pay.

In view of all that has been said about the de-

(OVER)

creased productivity of labor, it will be interesting to see what happens during the next four months. It would be gratifying to think that with the season of extraordinary vacations out of the way, Labor day this year may usher in a period of increased attentiveness to the job and higher output per man hour. —p. 84

• • •

**WPB CHIEF RETURNS:** Donald M. Nelson, former chairman of the War Production Board, is being recalled to Washington to lay the groundwork for the rapid mobilization of industry in case that becomes necessary. He will make a survey of materiel that would be required in waging another war. He also will draft a blueprint of the kind of a new War Production Board that would be needed if war should reoccur.

In assigning Mr. Nelson to these tasks, the government is acting prudently. At a time when there are so many points of friction throughout the world, it is well to keep alive a seasoned plan for industrial mobilization.

However, it is conceivable that Mr. Nelson can make an additional contribution to the government on his return to Washington. He is one of the few Americans who has seen Russia and talked with Joseph Stalin under exceedingly favorable conditions. His recollections of these experiences, pieced together with later information from other sources, might help official Washington to better understand the Soviet's latest puzzling behavior. —p. 74

• • •

**HOW NOT TO DO IT:** Everybody applauds the apparent desire of the government to begin to make a creditable showing in helping to provide urgently needed homes for veterans, but many question whether the methods now being employed will accomplish the purpose.

The latest development in the confusion that has attended the housing program is the transfer to Housing Expediter Wyatt of certain functions formerly handled by Civilian Production Administrator Small. Simultaneously, sharp cutbacks in nonresidential construction have been ordered.

Government officials seem to be incapable of realizing that there are numerous craftsmen in commercial, industrial and other nonresidential construction whose talents cannot be employed on residential construction. Too drastic a cutback on nonresidential jobs simply throws them out of work, halts some commercial and industrial construction and does not contribute in any way to the building of more homes for veterans. —p. 69

**SIGNS OF THE TIMES:** Naval officers who witnessed the atomic bomb tests at Bikini are convinced that the advent of this new weapon calls for an extensive redesign of naval vessels. They believe there will be substantial changes not only in hulls, masts, structural members and armor of the ships themselves (p. 76), but also in the design of valves, pumps, instruments, fittings and other accessories which proved "brittle" under the shock of atomic bomb attacks. . . . Disposition of about 5000 tons of steel, consisting chiefly of pontoon parts, has stirred up a hornet's nest. The steel, lying near Los Angeles, was turned over to WAA as salvage by the Navy. When WAA could not sell it as salvage (p. 85) the Navy took it back and offered it for sale as scrap to local consumers and dealers. A Hollywood exporter, not bound by OPA regulations, bid $1.31 per ton over the OPA ceiling, was awarded the material and was planning to ship part of it to Argentina when Navy officials in Washington halted delivery to the exporter and ordered all bids destroyed. The tonnage involved is small but the confusion attending this episode shows that there is something wrong in the machinery for disposing of surplus war material. . . . Detroit Editor A. H. Allen points significantly to the likelihood (p. 81) that the automobile industry, now losing money on every car built, will continue to do so through the balance of the year, even though assembly rates now are well above what was once considered a break-even point. . . . Canada's industrial reconversion from wartime to peacetime production is three-quarters accomplished (p. 77) and should be completed next spring. . . . The author of a timely article on economic aspects of tube bending (p. 94) has this to say about manual and mechanical power: "A strong man, worth $1 per hour, can generate ⅛ hp, so manpower costs $8 per horsepower-hour during an 8-hour day. You can buy all the electric power you want for 2 cents per horsepower-hour." . . . The office machinery industry, consisting of more than 30 manufacturers, is working on a backlog of unfilled orders of about $278 million (p. 65) and shipping machines at a rate of more than $30 million a month. . . . Industrial sales of paint, varnish and lacquer (p. 70) account for a third of all paint sales in the nation.

E. L. Shaner

EDITOR-IN-CHIEF

Bars of A4615, like all Ryerson Alloys, are unmistakably identified by color marking and heat symbol. When transferred to the Ryerson Alloy Report, marking and symbol give a positive check between steel and accompanying hardenability data.

# Now Back in Ryerson Stocks

## A4615-A4140-A4150 and other prewar alloys

Old friends, the alloy steels for which Ryerson stocks were distinguished in the days before Pearl Harbor, are back from war. They have been at the front for more than four years but now their special war jobs are finished and these steels are again available to everyone for prompt shipment from eleven Ryerson plants.

Of course the wartime triple alloys which proved satisfactory have been adopted as standard AISI steels and continue in Ryerson stocks. Both prewar and triple alloys in a wide range of sizes make your nearby Ryerson plant the ideal source for every alloy requirement.

In addition, Ryerson alloy service provides the advantages of the Ryerson Certified Steel Plan, featuring a time-saving Alloy Report with every shipment. The chemical analysis, heat treatment response and recommended working temperatures included in the report are a helpful guide for designers and heat treaters, a reliable record for purchasing men.

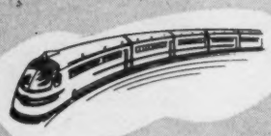
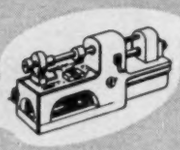
Diversified stocks plus the quality assurance of the Certified Steel Plan are two reasons why more manufacturers depend on Ryerson for alloy steel from stock than on any other source.

Whatever your alloy steel requirements, let Ryerson specialists work with you to supply the steel you need, when you need it. Call, wire or write the nearest Ryerson plant.

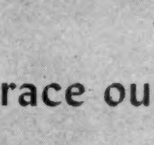
**JOSEPH T. RYERSON & SON, INC., Steel-Service Plants at: Chicago · Milwaukee · Detroit St. Louis · Cincinnati · Cleveland · Pittsburgh · Philadelphia · Buffalo · New York · Boston**

# RYERSON STEEL

# PARISH SAYS..

Whether or not you may be interested in producing one of these post-war or perhaps a modern or maybe it's new equipment for streamlined  or continuing the manufacture of vitally needed plant  then again it might be or a hundred and one other products that will grace our new free world...

Pressed metal parts and stampings point the way to perfect reproduction of modern design and low cost manufacturing. THE PARISH PRESSED STEEL CO. has realized that metal parts must be properly fabricated to meet the demands of manufacturers for beauty in design, shock and temperature resistance and surface protection through fine finishes. PARISH engineers are ready to assist you with your present and post-war fabricating problems from the drawing board to the finished product. We are equipped to reproduce the most intricate modeled shapes in aluminum or other metals, faithfully and economically. Why not call on PARISH for the very finest in engineering and modern production methods?



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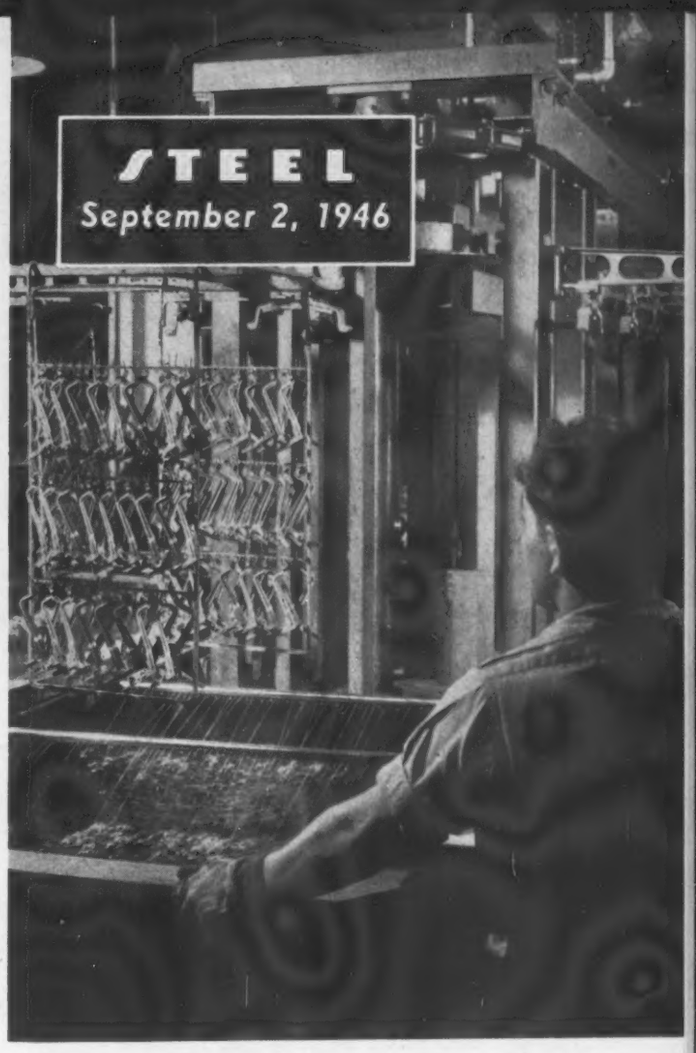
READING, PENNSYLVANIA

*Subsidiary of* DANA CORPORATION

WESTERN REPRESENTATIVE: P. SOMERS PETERSON, 57 CALIFORNIA ST., SAN FRANCISCO, CAL.

# Office Machinery Industry Faces Three Busy Years

***Demand for cost-cutting business equipment heavy. Backlog estimated at $278 millior Manufacturing costs have increased sharply due to higher labor rates, but selling prices have advanced only moderately. Export market is promising***



*Typewriter parts are automatically plated at the Royal Typewriter Co. plant in Hartford, Conn.*

OFFICE machinery manufacturers, most of whom only recently have completed reconversion, are working on a backlog of unfilled orders approximating $278 million.

Shipments are increasing as materials and components become easier and now are in excess of $30 million a month.

The industry, which produced little of its regular line of machinery during the war years, estimates the accumulated deficit in this type of equipment is sufficient to assure three years or more of capacity production.

In some machines, notably those in which competition is keenest and consumer demand heaviest, there probably is some duplication of orders, but production has not yet caught up with tremendous requirements for high-speed, cost-reducing office equipment in this category to bring out the extent. For portable typewriters, duplicate orders are believed to be substantial; for cash registers, bookkeeping machines, duplicating machines or standard typewriters such ordering is thought to be slight.

Included also under office machines are automatic registers, calculating machines, check handling, coin and currency handling, dictating, adding, envelope handling, time recording and continuous handling machines. In addition to these major types, shorthand writing, punch card tabulating, addressing, microfilm and postal machines also are included.

Office machinery manufacture is a close-tolerance, precision, yet mass production industry. During the war the industry produced large quantities of precision instruments, fuze assemblies, fire control, carbines, automatic pistols and scores of other parts and products requiring tolerances in the fractional thousandths. Production of typewriters, standard types, continued into 1943 before the all-out shift for war, although output of portables was halted earlier.

The stoppage in most types, coming rather suddenly, found the industry as a whole with a substantial inventory of parts, steel and components. This was stored as new materials came in for war goods and this inventory was an asset in early reconversion. Plant equipment, however, was badly snarled; many machines were worn out on war products, others unsuitable for normal output were replaced, and the first major reconversion problem was to get the plant into shape for civilian requirements, built up to record levels.

Plants ordered substantial new equipment, and although some machines are still undelivered, on the whole manufacturing departments are again in position for high output as reflected in heavier shipments each month. By mid-year, 1946, shipments had nearly doubled the early postwar period and are still increasing. But material and parts supply, including steel, has not paced progress made in plant and labor reconversion.

Bolstered with a fair inventory at the start of reconversion, new orders were placed for steel early and on this delivery was reasonably prompt. Production executives report that since that time delivery of raw materials has become progressively worse.

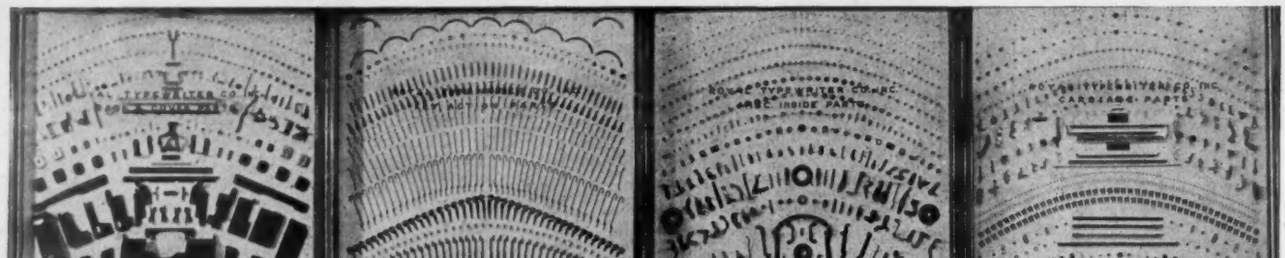
Presently steel supply is listed as bad. The left-over pre-war inventories have long since been consumed. Some estimate plants are not getting as much steel as consumed by 25 per cent. The industry requires about 75,000 tons a year, mostly premium grades.

For business machines, cold-rolled carbon strip in premium grades of light gages is a leading product; screw stock is also required in substantial quantities and precision requirements in finished products is reflected in steel specifications and grades.

A trend is noted toward greater use of stainless in strip form for decorative purposes.

Castings, including die castings, enter

By L. E. BROWNE
*Associate Editor, STEEL*



*Count 'em! These are the parts that go into one Royal typewriter*

into manufacture of machines by the thousands. Because of the shortages and extended deliveries in light iron castings, some parts have been re-designed for heavy stampings and steel stampings have taken a place in production programs, including typewriters, for which they may not be displaced. Considerable music wire and spring stock is also fabricated into parts.

Productive capacity has been expanded moderately. Some model changes are anticipated, although minor part changes and refinements are frequently and continuously being made in normal production runs. However, design and assembly of a complete new model of any office machine is a gigantic problem considering that a standard model typewriter has at least 1500 parts and some types considerably more, while an accounting machine consists of as many as 7500 parts.

The bulk of these parts are fabricated for assembly in machine builders' own plants; while some components are made by outside suppliers, relatively little work is farmed out. One component on which builders are dependent on others is fractional motors and the industry uses hundreds of thousands.

Motors have been and are a production bottleneck, but there are signs of an improvement. Bearings are also needed in large lots and some builders of office machines also assemble bearings, stamping racers and buying balls. Naturally, bearings required are in the smaller sizes and are not of the heavy-duty type; many are in the one-eighth inch size range, turned and machined.

**Industry Fully Converted**

Today the industry may be considered fully converted to peacetime production, but the changeover has not been without difficulties and required practically a full year to complete. In recent months the shortage of steel and other materials and components has been a retarding factor in the industry's effort to reach capacity output.

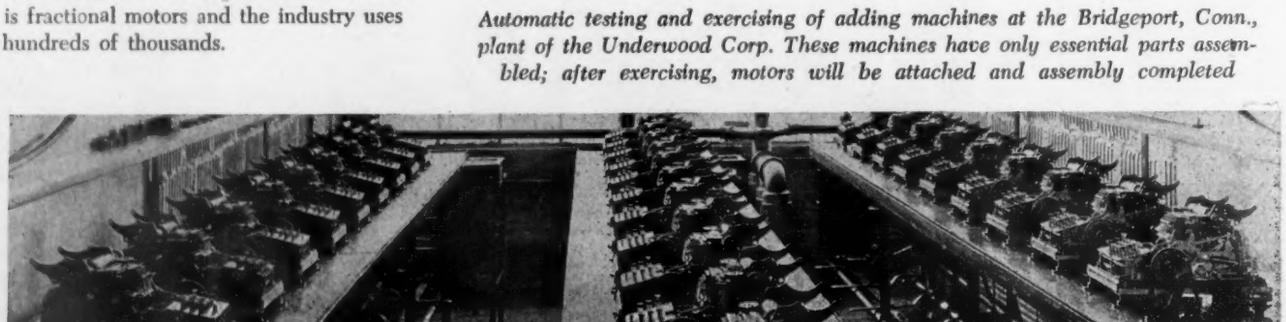
The increase in the costs of labor and materials has been another complicating factor. Employment in the industry approximates 50,000 and the ratio of labor costs to net sales is among the highest. Since the war, costs on some typewriters have gone up 50 per cent, while selling prices have advanced only about 12 per cent.

About 30 companies produce the bulk of office machinery, although some of these concerns make other products as well. In dollar value, shipments of typewriters have been heading the list. Latest available figures have monthly typewriter shipments, standard and portable, valued at close to $6 million; adding machines, $3.1 million; calculating machines, $3.0 million; and bookkeeping machines, $2.5 million.

There are 10 plants manufacturing typewriters, the same number making automatic registers, 12 making check handling machines, 11 adding, and 19 producing duplicating machines. Unfilled orders are heaviest in typewriters, with bookkeeping machines a close second and calculating machines third. Indeed, if there is much duplication in the typewriter backlog, as some suppose in the portable end, bookkeeping machines may be first in dollar value. The supply pipe lines are far from filled with most types of office machinery.

Before the war normal production of typewriters averaged close to 1,000,000

*Automatic testing and exercising of adding machines at the Bridgeport, Conn., plant of the Underwood Corp. These machines have only essential parts assembled; after exercising, motors will be attached and assembly completed*



a year, 600,000 standard and 400,000 portable, but what might be tabulated as a normal prewar year for the industry as a whole is marked by high and low spots; 1941, for instance, was a near-record period, substantially over 1940.

On the market are several new types of dictating machines, some using steel wire and others plastic tape or records. Machines in which were incorporated the same principles were used in military service. There is a sharp increase in the use of postage meters; from this source postal revenue last year was $211 million.

Portable microfilming machines may be expected to increase volume of record-keeping by microfilm, probably stimulated by V-mail war service.

Export demand is high and probably one-fourth may be marked for export. Foreign sales are expected to help to absorb large production with resultant decrease in costs. However, American business is in need of office machinery and while next year may witness a further easing in deliveries and supply, backlog of the industry is at an all-time high. War surplus is not expected to ease supply in the near future. Priority demand will keep the bulk of later models in government surplus off the market for several years.

## Kaiser-Frazer Corp. Takes Lease on Blast Furnace

Kaiser-Frazer Corp., Willow Run, Mich., has leased for three years the "Anna" blast furnace of Struthers Iron & Steel Co., Struthers, O. The stack has a daily capacity of about 500 tons. It had been operated as a merchant stack but has been down since last fall because of high operating costs and government ceilings on prices.

## New Open Hearth Planned For Otis Steel Co. Plant

Jones & Laughlin Steel Corp., Pittsburgh, plans to construct a 175-ton open-hearth furnace at the Riverside plant, Cleveland, of its subsidiary, Otis Steel Co., Cleveland. The new furnace will be the ninth open-hearth unit at the plant and will increase output there about 12½ per cent.

## Kelly Steel Works Inc. Sold To Youngstown Company

Kelly Steel Works Inc., Chicago, has been sold to Commercial Shearing & Stamping Co., Youngstown, which will expand the Chicago firm and operate it as a wholly owned subsidiary.

# Advisory Committee Recommends Higher Prices for Prepared Scrap

*NEW YORK*

HIGHER price ceilings for prepared scrap were awaited by the industry last week-end following recommendations for such action by the OPA Industry Advisory Committee at a meeting here Aug. 28.

While no specific figure was asked by the committee, observers believed the increase will be less than the $3.50 a ton advance requested by the directors of the Institute of Scrap Iron & Steel a few weeks ago. However, a spread of $5 between prepared and unprepared is reported to have been recommended by the advisory committee. This would compare with the present differential of $3.50. Committee also suggested freezing of the buying price on unprepared scrap.

This is the first time the advisory committee has recommended an increase on prepared scrap, having rejected applications for higher prices on at least two previous occasions.

Industry observers believe the higher prices, if and when announced, should provide the flow of scrap with a badly needed impetus. Normal flow of merchant scrap recently has dropped about 50 per cent in some districts, pending action of the price appeals of the scrap industry.

An increase in prices, even if it should be less than the $3.50 requested by the Scrap Institute directors, would provide some relief and should reduce bartering, upgrading and other measures taken in recent weeks to get around the ceilings.

The shortage in scrap likely will continue for some time, although higher prices are expected to improve the situation. The shortage continued a barrier to maximum steel production all through August.

A survey of producers by the Committee on Iron & Steel Scrap of the American Iron & Steel Institute revealed that at least one large producer has almost entirely exhausted its inventory. Several other plants have less than a one-week supply on hand. Three plants reported 10 days' supply, one has 11 days' supply on hand and four have 15-day inventories. Some other plants are more favorably situated but most have less than a month's supply in their stockpiles.

# Present, Past and Pending

**■ GOVERNMENT TO RELEASE HIGH-GRADE ZINC TONNAGE**
WASHINGTON—Limited release of high-grade zinc from government stockpile has been resumed to stave off impending shutdown of a number of zinc-consuming plants. Monthly output is running 31,416 tons less than normal consumption. Applications for zinc should be sent to CPA.

**■ SETTLEMENT OF CANADIAN STEEL STRIKE STILL BLOCKED**
TORONTO, ONT.—No progress is reported toward settlement of the strike directly affecting the three big basic steel producers in Canada. Steel Co. of Canada Ltd. is maintaining production but not shipping. About 100,000 workers in consuming plants have been laid off owing to the shortage of steel.

**■ JACK & HEINTZ GETS FORD CONTRACT FOR ENGINES**
CLEVELAND—Jack & Heintz Precision Industries Inc. has received a contract from Ford Motor Co. for 12 experimental light-weight engines for use in automobiles. If engines prove satisfactory, Ford will take 800 engines a day.

**■ WAA REOPENS BIDDING FOR SOUTH CHICAGO STEEL PLANT**
WASHINGTON—War Assets Administration has reopened bidding for purchase or lease of the government's $92 million steel plant in South Chicago, Ill., now under interim lease to Republic Steel Corp. New bids must be received prior to 3 p.m., Sept. 30.

**■ U. S. STEEL SUBSIDIARY BUYING DIESEL-ELECTRICS**
BIRMINGHAM, ALA.—Tennessee Coal, Iron & Railroad Co. is substituting 27 diesel-electric locomotives for 33 steam-powered locomotives now used in its transportation department. The program is expected to be completed by 1949.

**■ LAST OF THREE NUT AND BOLT PLANT STRIKES SETTLED**
CLEVELAND—Settlement of a strike at National Screw & Mfg. Co. last week brought to an end the last of three long closings by important nut and bolt suppliers to the automotive and other industries.

# Price Decontrol Procedures for Manufactured Products Set Up

***Requests for decontrol must originate with industry advisory committees serving Office of Price Administration and be presented through a newly organized Decontrol Division of OPA. Action on requests will be taken within 15 days***

PROCEDURES which manufacturers must follow in seeking price decontrol of their products are established by the Office of Price Administration in procedural regulation 17, now effective.

Requests for decontrol under terms of the Price Control Extension Act must originate, for the time being, with industry advisory committees serving OPA and be presented through a newly organized Decontrol Division of the agency headed by John Bulkley, deputy OPA administrator for decontrol.

OPA was directed under terms of the act to terminate price controls on nonagricultural commodities (a) by Dec. 31, next, where the commodity is not important to business or living costs and (b) whenever the present supply of a product exceeds or is about in balance with demand, including inventory requirements.

The general procedure under the new OPA regulation in seeking decontrol is as follows: An industry advisory committee must first file a formal petition for decontrol, showing in its petition its reasons for thinking the present supply-demand relationship of the commodity warrants decontrol. The request must be supported by a thorough analysis of current production and its relationship to demand, together with substantiating evidence to support the analysis.

### Data Suggested as Evidence

Suggested as substantiating evidence are such data as: Well-grounded estimates of demand at all levels of distribution; industry surveys of current production made by trade groups or research organizations of a representative sample of companies; surveys of raw material and labor supplies and geographical distribution, and any other statistical information available.

OPA emphasized that in determining whether production matches demand the tests would be: "Can those who buy the commodity for their own use at the existing ceiling prices do so with the same facility and width of choice they had before the development of wartime pressures and is this a purely fleeting condition or is there reasonable likelihood that it will continue?"

The agency suggests that, since comparison with prewar buying conditions is essential to the determination, parallel data for a typical prewar year be supplied. This should be supplied for exactly the same selling period as the current data.

Within 15 days of receiving the petition, OPA will approve or disapprove the request. If the committee requests a formal hearing, the agency will hold one within ten days of being requested, but consumer and labor advisory committees of OPA also will be extended an invitation to be heard.

In event of an adverse decision after the formal hearing, the committee can then appeal to the Price Decontrol Board, which will be the final tribunal.

Whenever an industry advisory committee decides to meet to consider the advisability of requesting decontrol, the meeting agenda must so state, and representatives of OPA's Decontrol Division and other OPA staff members must be privileged to attend.

**BACK TO WORK: Seamen on Great Lakes vessels affected by the strike of the National Maritime Union were returning to their ships last week as agreements were reached between fleet operators and the union providing for a 48-hour week at sea and a 44-hour week in port. Although only a small proportion of the total lakes fleet was affected directly by the strike, fears were held that the movement of coal and iron ore would be seriously disrupted. Operators of vessels not affected by the strike were reported preparing to match the wage gains granted to NMU-organized ships.**
NEA photo

# Industrial Building Is Reduced Sharply To Speed Housing Program

***Nonresidential construction to be limited to $35 million a week against former ceiling of $48 million. National Housing Expediter Wyatt to handle housing priorities and cutbacks in nonhousing programs***

SHARP cutbacks in nonresidential construction, increased priorities for housing materials and further price relief for producers of building materials were ordered last week as the government moved to give the housing program preference over industrial construction and production programs.

Apparent winner in the contest for scarce materials was National Housing Expediter Wilson Wyatt. Mr. Wyatt will take over the job of handling housing priorities and cutbacks in nonhousing construction formerly handled by the Civilian Production Administration under John D. Small.

Some observers predicted that the added emphasis to be given the housing program may result in still further shortages of pig iron and other critical materials for the production of automobiles, railroad equipment, consumer durable goods and other critically needed goods.

The National Housing Authority last week issued regulation No. 5 under which the number of critical items is expected to be doubled and the amount of set-asides for housing increased up to 100 per cent of total output on some items. The agency said the new regulation, which succeeds that of the CPA, will not affect applications already approved or make major changes in the priorities system.

At the same time, CPA Administrator John Small said he was prepared to transfer 1500 members of his staff and the funds supporting construction activities of the agency to Mr. Wyatt's office. Mr. Small also endorsed a 27 per cent further cutback in nonresidential construction in order to get "every new home finished by the time the snow flies."

Beginning Sept. 10, all new applications for construction authorization and "HH" priorities will be filed with the NHA while compliance functions relating to the use of these rating set-asides and other restrictions on dealers, wholesalers and manufacturers will still be handled by CPA's Compliance Division.

NHA has delegated to the Office of Price Administration the job of enforcing the maximum sales prices and veterans preference requirements of the veterans housing program.

Under the new program, amount of construction permitted for commercial, industrial and institutional purposes has been cut $13 million to $35 million a week. The present ceiling on nonresidential construction is $48 million and CPA has been authorizing applications recently at the rate of about $45 million.

In view of the tremendous demand for building materials in the present intensive drive for new housing, CPA issued a warning that no stockpiling of building materials in anticipation of future construction is permitted.

The following actions, effective Sept. 1, were also announced last week by the CPA and NHA:

1. Dealers and distributors must reserve for priority ratings 75 per cent of their receipts for 43 of the 57 materials listed on schedule A of priorities regulation 33 and even larger proportions must be set aside for the remaining 14 materials.

2. Addition of 27 materials in short supply to schedule A, making a total of 57, assures builders that they can secure the principal materials necessary to construct and complete houses.

3. Producers' nonhousing output of cast iron soil pipe limited to 7 per cent of their previous month's tonnage.

4. No person shall use cast iron soil pipe for any purpose except installing, repairing or maintaining sewage disposal systems in buildings, and that such pipe shall not be used beyond 5 feet from the building line, except for replacements (effective immediately in cities that have codes consistent with its provisions; Oct. 1 in all other cities).

Ten of the 14 materials whose set-aside ranges upward from 75 per cent also are listed in a new section of PR-33 which is known as schedule B. The materials and set-asides are in part: Bathtubs, 95 per cent; kitchen sinks, 75 per cent; lavatories, 90 per cent; water closets, tanks and bowls, 90 per cent; cast iron soil pipe and fittings (under 5 inches), 80 per cent; warm air furnaces, and radiation, 75 per cent each.

# July Pig Iron Output Best in 12 Months

Despite the fact that pig iron supply is far short of needs of steelmakers and foundry operators, July production at 4,705,277 net tons was best since July, 1945, when 4,801,457 tons were made, according to figures by the American Iron & Steel Institute. The July total compares with 3,682,273 tons turned out in June, a gain of 1,023,004 tons. Percentage of capacity engaged in July was 82.4, compared with 66.5 in June and with 84.1 in July, 1945. The July total includes 55,235 tons of ferromanganese and spiegeleisen.

Cumulative tonnage for seven months this year is 22,512,098 tons, compared with 33,954,702 tons in the comparable period last year, representing 57.5 per cent of capacity, compared with 86.8 per cent for seven months in 1945. The decline for seven months totaled 11,442,604 tons, a deficit sufficient to account for the current shortage.

**Blast Furnace Capacity and Production—Net Tons** JULY - 1946

| | Number of companies | Annual blast furnace capacity | Production | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Pig Iron | | Ferro Manganese and Spiegel | | Total | | Percent of capacity | |
| | | | Current month | Year to date | Current Month | Year to date | Current month | Year to date | Current month | Year to date |
| DISTRIBUTION BY DISTRICTS: | | | | | | | | | | |
| Eastern | 12 | 12,988,970 | 833,981 | 4,092,674 | 29,262 | 118,708 | 863,243 | 4,211,382 | 78.4 | 55.8 |
| Pittsburgh-Youngstown | 16 | 25,939,940 | 1,878,364 | 8,559,369 | 19,084 | 68,792 | 1,897,448 | 8,628,161 | 86.3 | 57.3 |
| Cleveland-Detroit | 7 | 6,557,500 | 483,488 | 2,527,756 | - | - | 483,488 | 2,527,756 | 87.0 | 66.4 |
| Chicago | 7 | 14,093,510 | 1,010,336 | 4,819,447 | - | - | 1,010,336 | 4,819,447 | 84.6 | 58.9 |
| Southern | 9 | 4,924,670 | 330,640 | 1,648,964 | 6,889 | 53,976 | 337,529 | 1,702,940 | 80.9 | 59.5 |
| Western | 5 | 2,836,000 | 113,233 | 622,412 | - | - | 113,233 | 622,412 | 47.1 | 37.8 |
| TOTAL | 37 | 67,340,590 | 4,650,042 | 22,270,622 | 55,235 | 241,476 | 4,705,277 | 22,512,098 | 82.4 | 57.5 |

# High Output Fails To Meet Demand

***Dollar volume of sales of industrial paints, varnishes and lacquers is nearly double prewar level, but demand is so great that apparent shortage exists. Bright outlook seen for porcelain enamel***

By VANCE BELL
*Associate Editor, STEEL*

TODAY'S apparent shortage of some industrial finishes results not from low production of finishes but from a terrific demand that has pushed current output of some types of finishes to a level nearly 100 per cent above that which prevailed just before World War II started. In fact, the current production of some finishes is the greatest of any in the past ten years, except for 1945 when war production was at its zenith.

Limiting producers of some types of finishes from stepping up their output further is the difficulty of obtaining raw materials.

Even greater demand would exist for the present supply of finishes if steel, particularly sheets, were available in greater quantities to steel consumers, many of whom apply protective and decorative finishes to their metal products.

Indicative of the huge demand for finishes is a report by the National Paint, Varnish & Lacquer Association Inc., Washington, that industrial sales of paint, varnish and lacquer by 680 establishments representing 90 per cent of the volume in the United States totaled $23,653,045 in June, compared with $12,585,597 in June, 1939, and $26,302,893 in June, 1945. Sales for the first half of 1946 amounted to $130,950,922, compared with $69,409,601 in the first half of 1939 and $150,120,075 in the first half of 1945.

### Third of Sales Are Industrial

Industrial sales of paint, varnish and lacquer account for approximately one-third of all paint sales in the nation. Total sales in June were $66,065,330 and for the first half of 1946, $386,755,508.

Because of the huge backlog of demand for products of all types, a great many of which require a finish of some kind, the manufacturers of industrial finishes foresee a bright future. For example, R. L. Turk, president of the Porcelain Enamel Institute, Washington, and vice president of Pemco Corp., Baltimore, said, "the future would be bright even if there were no new markets for porcelain enamel. There are, however, endless new markets that have developed because of wartime experimentation." Preparing for this demand, one large producer of porcelain enamel is building two new plants to augment its capacity. While shipments of porcelain enameled products currently are higher than they were a year ago, they would be considerably greater if enamelers could procure all the enameling sheets they need. Nevertheless, shipments of porcelain enameled products in May totaled $5,777,000, compared with $3,178,000 in May, 1945, and $6,151,000 in April, 1946.

Discussing new possibilities for porcelain enamel, Mr. Turk cited work in the exhaust and muffler field. Previously, in the transporation field porcelain enamel, he pointed out, was thought of only in connection with decorative installations. "During wartime, experimentation with exhaust pipes and mufflers to discover a material that would eliminate or minimize the high replacement rate on these parts, porcelain enamel proved its value. Special formulas able to withstand extreme

*Although there is demand today for practically all the industrial finishes that can be made, producers of finishes are mindful of the day when the supply may exceed the demand and are constantly striving to improve their products and thus strengthen their competitive position. Illustrative of such efforts is this scene in a paint company research department where a finish is being sprayed on a radio cabinet for test purposes*

heat and corrosion far outlasted all other materials and metals. In addition, research found that the porcelain enamel coating on ordinary steel would stand up even when subjected to constant high temperatures.

"As a result, today we find a definite trend towards the use of porcelain enamel for exhaust and muffler parts, not only in the automobile industry, but in airplane manufacture as well. This," Mr. Turk said, "is just a specific example of the many cases where porcelain enamel, because of wartime developments, can look for a vastly widened future market."

Both the porcelain enamel and the paint industry have considerable capacity that is not being utilized. The former industry finds it unnecessary to operate at capacity because of a shortage of enameling sheets, and the paint industry is operating on only a 40-hour week because its supply of raw materials is not sufficiently large to warrant longer operation.

**Supply of Flaxseed Reduced**

The difficulty of obtaining raw materials stems from the war's drain on supplies, price ceilings, and strikes. In some quarters, diplomatic relations are also blamed. As to the latter, some industrial paint men say that Argentina, which normally supplies the bulk of the flaxseed from which linseed oil is made, is withholding flaxseed because of strained relations between that country and the United States. Some say that Argentina is diverting flaxseed to England and Russia. Whether it is because of price or diplomatic reasons that Argentina is withholding flaxseed from the United States, the U. S. Commerce Department reports that little flaxseed is coming to this country. Imports of flaxseed in April, 1946, were 2000 bushels, compared with 646,000 bushels in April, 1945. In March, 1946, they were 432,000 bushels, compared with 803,000 in March, 1945.

The demand for finishes would be even greater than it is today had not strikes interfered with industrial reconversion and the establishment of new businesses.

Among handicaps facing paint makers is a shortage of steel shipping containers. Most industrial paints are shipped in either five-gallon cans or 55-gallon drums. The container shortage is more critical with respect to the five-gallon cans because they are usable but once, whereas drums usually are returned to the paint maker and refilled.

Regardless of the present handicaps, makers of industrial finishes are optimistic because the rising rate of industrial production indicates a continued heavy demand for protective and decorative finishes.

# Government Moves To Ease Transportation Crisis; Shorter Turn-Around Time Asked

EMERGENCY action by eight governmental agencies to avert the threatening transportation crisis arising from the shortage of freight cars and a heavy and increasing volume of freight traffic was ordered last week by Reconversion Director John Steelman.

Railroads estimate they are short about 1,000,000 cars. New car construction has been slowed by strikes and the shortages in steel, lumber, castings and other essential materials. Transportation officials fear that by the middle of next month when carloadings reach a seasonal peak, 50,000 to 75,000 carloads of freight may be backing up weekly, causing a backlash in the country's entire economy.

Agencies called upon to help alleviate the situation include the Civilian Production Administration, Office of Defense Transportation, War Shipping Administration, Maritime Commission, National Housing Administration, Office of Price Administration, Department of Agriculture and Department of State.

To meet the emergency, Mr. Steelman said the following steps will be taken:

1. Wherever possible cross country freight will be diverted to intercoastal or coastwise shipping.

2. OPA will promptly review increased costs arising from such diversion.

3. CPA will speed scarce materials needed to repair 80,000 old cars and build 40,000 new ones this year.

4. ODT will encourage shippers and receivers to shorten the turn-around time, even to unloading and loading cars on week-ends.

5. ODT will tighten regulations on lcl shipments.

6. ODT and Department of Agriculture will co-operate to eliminate bottlenecks which threaten perishable foods.

7. State Department will seek prompter placement of foreign orders for freight cars to be built in this country to stimulate production on domestic orders.

## Tool & Die Association Schedules Annual Meeting

National Tool & Die Association will hold its annual meeting at the Congress Hotel, Chicago, October 23-26, 1946. General sessions are to be on Thursday and Friday, Oct. 24 and 25, with annual dinner and social gathering on Friday evening.

The association, of which Richard F. Moore, president, Moore Special Tool Co. Inc., Bridgeport, Conn., is president, includes in its membership leading contract die and tool shops throughout the country—about 70 cities from coast-to-coast being represented.

## ASTE Meeting To Be Held In Pittsburgh Oct. 10-12

Semiannual convention of the American Society of Tool Engineers, which will be held at the William Penn Hotel, Pittsburgh, Oct. 10-12, will have as its theme "better goods at lower prices while paying higher wages," A. M. Sargent, president of the society, announced recently.

Highlights of the program include seminars on technical subjects, visits to industrial plants in the Pittsburgh area, showing of engineering films and the semi-annual banquet.

# Calendar of Meetings . . .

**Sept. 9-12, American Mining Congress:** Annual Metal Mining Convention and Exposition, sponsored by the Western Division, AMC, to be held at Denver. Julian D. Conover, 309 Munsey Bldg., Washington, is secretary.

**Sept. 10-14, American Chemical Society:** Semiannual meeting and National Chemical Exposition, Coliseum, Chicago, sponsored by the Chicago section, ACS. Show headquarters are at 1513 S. Wabash, Chicago.

**Sept. 11-12, Society of Automotive Engineers:** National tractor meeting, Hotel Schroeder, Milwaukee. John A. C. Warner, 29 West 39th St., New York 18, secretary and general manager.

**Sept. 12-14, National Association of Foremen:** Annual convention, Forest Park Hotel, St. Louis. Association headquarters are at 11 W. Monument Bldg., Dayton 2, O.

**Sept. 14, Central District Enamelers' Club:** Golf tournament and clambake, Aurora Country Club, Aurora, O. H. F. Bond, Ferro Enamel Corp., Cleveland, is handling reservations.

**Sept. 16-20, Instrument Society of America:** National Instrumentation Conference and exhibit, William Penn Hotel, Pittsburgh. Richard Rimbach, Pittsburgh, secretary.

**Sept. 21, Second annual symposium on "Modern Metal Protection:"** Hotel Cleveland, Cleveland, sponsored by the local sections of American Chemical Society, American Institute of Chemical Engineers and Electrochemical Society.

**Sept. 30-Oct. 2, American Society of Mechanical Engineers:** Fall meeting, Boston. C. E. Davies, 29 West 39th St., New York 18, secretary.

**Oct. 1-4, Association of Iron & Steel Engineers:** Convention and Iron and Steel Exposition, Public Auditorium, Cleveland. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

# July Mechanical Press Shipments Establish Record

***Backlog of orders totals $39 million, equivalent to 12 to 13 months' production. Diemaking capacity well booked***

*CLEVELAND*

SHIPMENTS of mechanical presses increased to a new all-time high in July and are expected to remain at a high level through August. The value of mechanical presses and replacement parts shipped in July rose to $3,712,000 compared with $1,462,000 in June and were more than four times the monthly shipments of $865,000 in July, 1939.

The July figure is the more remarkable because some plants were closed during part of the month for vacations. The record was attained partly through the shipment of some finished presses which had been waiting for electric motors and controls. While expansion of facilities accounts for part of the increased output, improvements in methods and equipment are also important factors.

Backlog of orders remains on an average of 12 to 13 months, with an estimated total value of $39 million.

Some buying has been withheld due to the difficulty in obtaining necessary dies. Very few diemakers in this district can take on additional business for delivery over the balance of this year and some are booked into the second quarter of 1947. The pattern supply situation has eased considerably during the last 30 days and is not a serious problem at present.

**To Speed Sales of Welders**

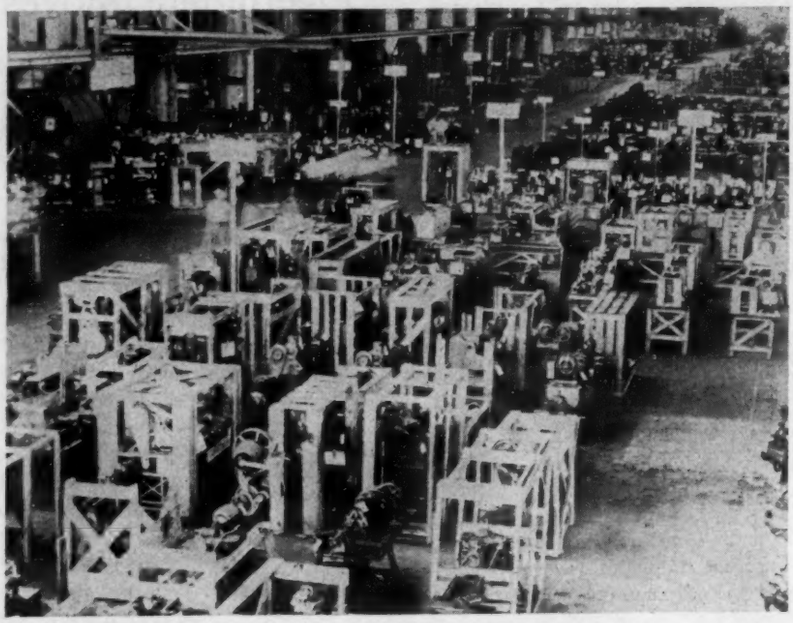
War Assets Administration plans to speed up the disposal of surplus resistance welder machines. More than 1900 of the welders, costing $10 million when new, have been turned over to 14 regional WAA offices for disposal, and more such equipment undoubtedly will be declared surplus by agencies which acquired it during the war.

Representatives of the industry declare that the manufacturers of the equipment are in the best position to sell it to private industry, and they advised that the disposal could be accomplished rapidly, but said that WAA must allow sufficient profit to make the disposal worth the manufacturers' efforts.

Representatives of the industry recommended that a wholesale price on this equipment be established for the manufacturers, in order that they might purchase the equipment at a mark-down, recondition it, and sell it with a guarantee. The industry has an interest in wanting to see that the proper machine, in proper condition, goes into the proper plant in order that the customer may be satisfied with the equipment.

Machines which are highly specialized, such as for welding steel landing mats for combat airports, and have no peacetime uses should not be scrapped but should be sold on a sealed bid basis in order that their valuable component parts might be recovered, the industry recommended.

WAA was also advised that stocks of spare parts for the welders should be offered to the manufacturers of the parts, who have sales outlets through which they can dispose of them.



**SURPLUS TOOLS: Scheduled to be sold last week under the auctioneer's gavel was a large number of lathes and other machine tools, a portion of which are shown above. The tools, which were crated and ready for sale, were valued at $54 million and were located at the Lincoln Ordnance plant at Madison, Ill. NEA photo**

## Tool and Die Makers Strive To Save Training Program

The National Tool & Die Manufacturers Association, Cleveland, has appealed to the Veterans Administration to help prevent the veterans' training program from being disrupted by a new law that drastically reduces federal benefits which have supplemented wages paid to men learning trades.

The association charges that the new law (S. 2477, amending the GI Bill of Rights) was slipped through Congress without hearings during the last week of the session. Federal benefits supplementing wages have made it possible, the association pointed out, for an ambitious veteran to finish his industrial training course even though he has a family to support. The training program, the association said, had promised to go far toward relieving the present serious shortage of tool and die makers.

## Cincinnati Tool Builders Will Maintain Operations

**Cincinnati**—Trends in the machine tool market are unchanged. Despite some tapering, during recent months, in new ordering the district manufacturers will maintain production schedules at current or higher levels to cut backlogs. A position making for quicker deliveries is sought.

## Chicago & North Western's Tool Purchases Heavy

**Chicago** — By the end of this year Chicago & North Western Railroad will have spent $3,800,000 on its program started in 1944 for the purchase of shop machinery, tools and other work equipment to modernize its facilities.

New shop and power plant machinery and tools alone involve a cost of approximately $3 million.

# GOVERNMENT CONTROL DIGEST

*Weekly summaries of orders and regulations issued by reconversion agencies. Symbols refer to designations of the orders and official releases. Official texts may be obtained from the respective agencies*

OFFICE OF PRICE ADMINISTRATION

**Carbon Products:** Increases in ceiling prices of electric motors, generators, converters, etc. which were effective as of May 13, may not be applied to carbon, graphite and metal-graphite brushes and contacts. This action is effective Aug. 28. (MPR-136; OPA-T-4910)

**Automobiles, Farm Equipment:** Firms performing repairs and maintenance services on automotive vehicles and farm equipment have been provided with an automatic adjustment formula for changing their charges for labor and a similar formula for adjustment of prices on fixed-charge jobs. (MPR-165; OPA-T-4916)

**"Freeze" Prices:** Resellers of products sold at wholesale or retail under "freeze" ceilings are permitted to figure Mar. 31, 1946, percentage mark-ups and to apply these mark-ups to current costs of acquisition. This permits them to pass on increases granted suppliers since that date. (SO-176 to GMPR; OPA-T-4921)

**Armored Cable:** Resellers of armored cable granted a percentage pass-on of two general increases granted manufacturers of armored cable on May 8 and June 14, averaging 27 per cent. (MPR-82; OPA-T-4923)

**Brass and Bronze Ingots:** Brass and bronze ingot prices increased to cover producers' loss in melting scrap resulting from increased scrap prices after June 3. Effective Aug. 27, maximum prices of 85-5-5 (red brass), yellow brass, 88-10-2, and 80-10-10 bronze ingot groups increased 0.25c per pound. Producers of trade name ingots may increase prices by 2.375c per pound of copper contained and 1.75c per pound of lead contained in their alloy ingots. (MPR-202; OPA-T-4924)

**Brass Mill Products:** Distributors' maximum prices for brass mill products increased 3.04 per cent, effective Aug. 23. In effect, this increase replaces the dollar-and-cent pass-on formerly allowed resellers with a percentage pass-on. (MPR-408; OPA-T-4927)

**Beehive Oven Coke:** Maximum prices for beehive oven coke produced in the Connellsville district of Pennsylvania increased $1.35 per net ton for hand-drawn coke and $1.25 for machine-drawn coke, effective Aug. 22 (MPR-77; OPA-T-4928)

**Lead Products:** Resellers of lead products may raise their maximum prices enough to restore their Mar. 31, 1946, percentage mark-ups. (SR-14G; OPA-T-4933)

**Industry Advisory Committees:** Industry advisory committees authorized to petition for decontrol of commodities subject to price control, and to petition for price adjustments in accordance with new manufacturers pricing standards. (Procedural Reg. 13; OPA-T-4936)

**Wire and Cable:** Manufacturers using silver in producing wire and cable may raise ceiling prices for these products by the same amounts as their silver costs have been increased, effective Aug. 23. (MPR-82; OPA-T-4937)

**Lead:** Dealer premiums for resellers of primary and secondary lead advanced to restore their average percentage mark-ups in effect Mar. 31. New premium differentials for resellers of lead on a cents per pound basis, fob point of shipment, over the maximum carload base prices are: 0.85c, 20,000 lb and less than a carload; 0.95c 10,000 lb and less than 20,000 lb; 1.30c 2000 lb and less than 10,000 lb; 1.90c less than 2000 lb. (MPR-69 and 70; OPA-T-4940)

**Copper:** Premiums for copper resellers raised ¼-cent per pound in each quantity sales bracket, effective Aug. 23. (MPR-15; OPA-T-4941)

**Construction Materials:** Resellers of nine types of building and construction materials permitted to increase ceiling prices by the percentage amount of the increased acquisition costs resulting from inbound rail freight increases since Mar. 31. (SO-179; OPA-T-4942)

**Building Materials:** Resellers of following items are permitted to restore their Mar. 31, 1946, percentage mark-ups: Lead pigments and lead paste products, in the east central, south central and eastern areas; metal lath in the Ohio-Michigan production area. Several other categories also were covered by the action. (GMPR. MPR-188, 45, 206, 224, 466, and 592; OPA-6731)

**Vises:** Interim price increase granted manufacturers and resellers on vises May 1 has been raised from 8 per cent to 17 per cent, effective Aug. 23. (MPR-136; OPA-T-4943)

**Warm Air Furnaces:** Maximum prices for warm air furnaces (24 in. and smaller) raised by 10 per cent over June 30 price ceilings, effective Aug. 28. (MPR-591; OPA-6724)

**Compressors:** Resellers' ceiling prices for compressors and condensing units, 5 horsepower and less in capacity, and service parts, therefor, warm air furnaces, floor and wall furnaces, cast iron radiation and accessories, specified tanks and vessels, brass plumbing fixture supply fittings and trimmings and waste fittings and trimmings have been increased, effective Aug. 23. (MPR-272, 591, and 96; OPA-6735)

**By-Product Coke:** Distributors of by-product and retort gas coke have been provided with a procedure to fix new individual price ceilings that cover their average current costs plus their average percentage discount or mark-up in effect on March 31, 1946. Distributors of by-product coke sold for use in foundry cupola or blast furnace are excluded from the new pricing procedure because their March 31, 1946, maximum prices did not provide a margin for their sales. Instead, flat dollar-and-cent maximum prices were fixed and these distributors were able to buy and resell only because of price concessions by their suppliers. (MPR-29; OPA-T-4945)

**Nails:** Ceiling prices for retail sales of standard wire nails raised, effective Aug. 23, in an action which brings the retail sales of nails under one regulation and which reflects the increases previously authorized for nail manufacturers and jobbers. (SR 14 to GMPR, SO-151; OPA-6725)

**Machines and Industrial Equipment:** Resellers' ceiling prices for machines, machine parts and industrial equipment raised, effective Aug. 23, as follows to reflect the full percentage mark-ups of recent increases in their manufacturers' maximum prices: Gears, pinions, sprockets, speed reducers and chains, 13 per cent, and gear motors, 13 to 27 per cent as listed in a table of net unit increases applicable to any gear motor made and sold as a unit; fans and blowers 9 per cent for fractional and 14 per cent for integral horsepower motors; meat packing and poultry processing machinery and equipment, 8.5 per cent; gasoline pumps, power operated, 6.9 per cent; bakery machinery and equipment, 9 per cent; steel power boilers and equipment, 16 per cent. (MPR-136; OPA-T-4929)

CIVILIAN PRODUCTION ADMINISTRATION

**House Trailers:** Manufacturers of house trailers for veterans have been made eligible for priorities assistance in getting materials. This assistance will be in the form of authority to use an HH priority rating or to place certified orders for minimum quantities of materials needed to produce VEHP house trailers. Manufacturers are to apply to the National Housing Agency, Washington 25, on form NHA 14-44. (PR-33; CPA-532)

OFFICE OF DEFENSE TRANSPORTATION

**Freight Loadings:** Carload freight loading requirements for specified commodities under provisions of orders ODT-18A include the following: Bolts, nuts, rivets, screws, washers and nails in packages in closed freight cars, not less than 60,000 lb. (ODT-18A-1; ODT-1076)

WAR ASSETS ADMINISTRATION

**Strategic Materials:** New procedures for stockpiling strategic materials have been issued by WAA, providing for transfer to the government stockpile of all government-owned surplus materials determined by the Army and Navy Munitions Board to have strategic possibilities and which may be needed for the common defense. New features of this regulation as compared with the previous SPA Reg. 17 are: (1) No distinction is made as to category, namely, minerals and metals and strategic materials; (2) no minimum pricing requirement in disposition of strategic materials to satisfy civilian deficiencies; (3) Army and Navy Munitions Board may acquire government-owned surplus strategic materials without an actual cash outlay except that they may not in any fiscal year exceed in dollar value in acquisition from surplus stocks an amount which in turn exceeds the actual congressional appropriation for such fiscal year; (4) a central control is established by having RFC review reports from all owning agencies of surplus strategic materials to determine whether disposition will be for the stockpile, sale to meet civilian deficiencies as determined by CPA, or declared surplus. The new regulation also provides that the CPA estimate current requirements of industry. This will be accomplished on a yearly basis instead of six months' supply. Sales to satisfy civilian deficiencies as found by CPA will continue to take precedence over transfer to stockpile. (Reg. No. 17; WAA-528)

OFFICE OF INTERNATIONAL TRADE

**Export Licenses:** OIT has added 32 additional building materials and equipment to the list of products which require individual licenses for shipment abroad. Products added include: Woven-wire screen cloth; heating system controls; circular saws; steel band, pit drag and mill saws; crosscut and hand saws; augers and bits; shovels, spades, scoops and drainage tools; ballast forks, stone forks and trowels; guttering, metal roofing sheets, roofing steel; brass and bronze window strips; motors, 1/3 horsepower and under; temperature controllers and parts; wheelbarrows; planers, matches, jointers and molders; concrete block and bending machines; and the following types of machinery: Sawmill, veneer, woodworking and brickmaking. (OIT-84)

## OIT To Grant Exporters Additional Licenses

Effective immediately, exporters of building materials will be permitted to submit more than one application for an export license for Group K countries during a calendar quarter, if shipments are to be made from more than one port of exit, or if unusual circumstances exist, the Office of International Trade has announced, provided the total amount of materials covered by all applications from a single exporter do not exceed the amount which would have been covered by one application. Holders of licenses may have them replaced by two or more licenses for use at different ports.

# Windows of Washington

***Recall of Donald M. Nelson to lay groundwork for rapid mobilization of industry in event of another war comes at a time when hopes of achieving a permanent peace are sinking. Forty-four per cent of federal budget earmarked for military use***

RECALL to Washington of Donald M. Nelson to lay the groundwork for rapid mobilization of industry in case of another war comes at a time when sentiment in many key places in the government is undergoing an important change.

Heretofore, emphasis has been on bending every effort to secure a permanent peace. Of late there has been increasing pessimism as to the possibility of achieving this goal. There is increasing fear that the United States may be drifting close to another war.

In view of this situation, Mr. Nelson's new assignment is of the utmost significance both to the country and to the country's war industries. The former chairman of the War Production Board, who generally is given credit for having played the leading part in mobilizing industry in World War II, has been charged with the responsibility for doing the paper work in preparation for the next emergency. His job breaks down into two main parts:

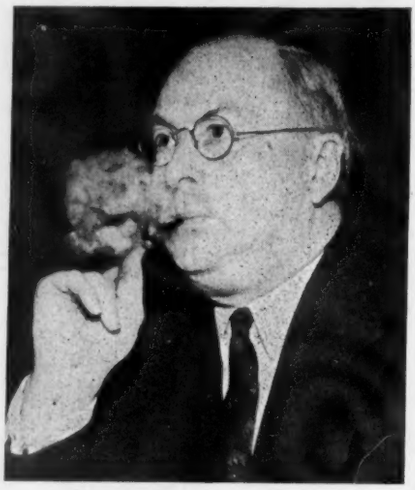
1—A survey of the materiel of all types, and in quantities needed, that would be required for another war as indicated in the light of today's experience and knowledge. Over against this is to be compiled a list of all the country's industrial facilities that can be enlisted in the manufacture of such materiel. In this study, Mr. Nelson will work in close contact with representatives of the Army and Navy and of the various industries involved.

**Production Board To Be Planned**

2—The laying down of a blueprint for a new War Production Board—providing for the priorities and other machinery that will be needed. This blueprint further will list all jobs to be done, so that the needed key men can be drafted from industry without delay—if and when the call comes—and handed a complete assignment when they arrive in Washington. The idea is through this advance planning to get the next War Production Board organized and functioning without the faltering incident to our entering upon World Wars I and II.

Mr. Nelson, now busy arranging his affairs in California in preparation for a rather protracted stay in Washington, is expected back in the capital city almost any day. His headquarters will be in Rooms 1228-30 Federal Reserve Building—on Constitution avenue across from the Navy Building. His present plan is to have only a small personal staff, and to have most of the detailed work done by Army and Navy personnel under his direction. He will work closely with the Industrial College of the Armed Forces and the Army and Navy Munitions Board.

Washington observers believe that if we are due to get into another war we are in much better shape to fight now than might be the case at some date in the future that might be preferred by potential enemies. Perhaps a rather general impression that we destroyed our war potential as rapidly as possible after V-J Day resulted from many gloomy statements by the military in their effort to get sympathetic treatment from Congress. Certainly this impression is not justified.



DONALD M. NELSON

Despite tremendous relaxation after V-E Day and V-J Day, our military potential is gratifyingly high. Although Congress did not legislate universal military training, the Selective Service Act will continue operative until March 31, 1947. The rate at which the armed personnel is being scaled down has been sharply reduced. We will have a combat army of 1,070,000 officers and men and a Navy of 710,000 officers and men on July 1, 1947. These are nuclei which, considering the vast reservoirs of veterans, could be built up rapidly to our maximum strength.

To arm our future enlarged army and navy we have in storage large reserves of guns, ammunition, tanks, planes, communication equipment and other materiel, and vast numbers of merchant and naval vessels which merely will require depreservation and operating crews. We continue to manufacture atomic bombs, and we already have made great progress since the last war with such new weapons as guided missiles, robot planes, much more efficient signal and control equipment, bacterial warfare, improved underwater devices, etc.

Another measure of our present military potential is the fact that 44 per cent of the federal budget now is earmarked strictly for military purposes. Of the $41 billion to be spent for all federal purposes in the fiscal year ending June 30, 1947, the Army and Navy will spend $18 billion.

Another measure of our present military potential is the percentage of this $18 billion to be spent on research and development work. Unfortunately no overall figures have been released.

For example, Army Ordnance has research and development contracts with more than 600 manufacturing establishments and with 30 research institutions. These contracts involve such projects as the development of lighter but stronger steels for armor plate and guns, the use of the extrusion process in forming steel, and the development of numerous projects associated with new and improved weapons.

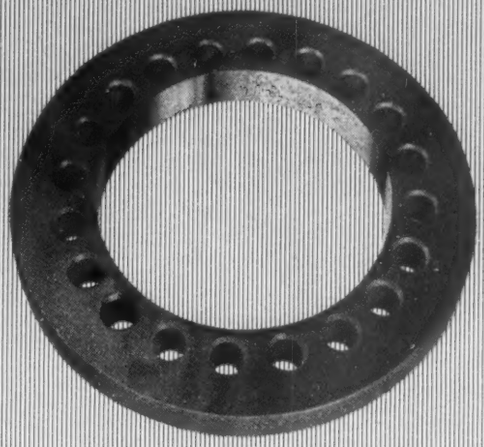
"We keep on scanning industry," an Ordnance spokesman told STEEL, "and we let contracts to a large extent with a view to benefiting from all the help that industry can give us. We are trying not to miss any bets."

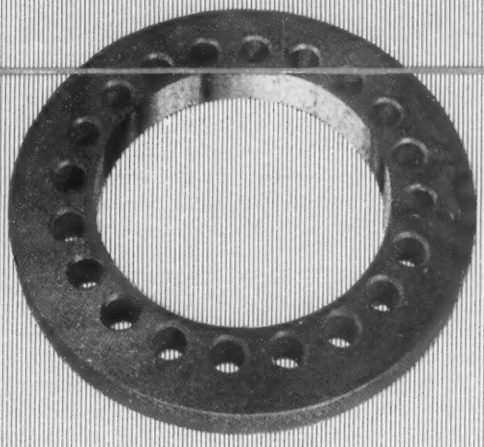
The largest single program is that of the Army Air Forces which has let developmental contracts involving hundreds of millions of dollars. Other Army units—Quartermaster Corps, Chemical Warfare Service, Engineers, Signal Corps and Transportation Corps—have similar programs in operation.

As to the Navy, a special mandate from the Congress has resulted in replacement of the former Office of Research and Inventions by the new Office of Naval Research. The latter now has in operation 177 contracts involving fundamental research and this number is being increased right along.

## Frowns on New Tax Policies

Under conservative Secretary John W. Snyder, the Treasury Department will no longer serve as a sounding board for New Deal tax proposals. In administration councils the Treasury Department now takes the view that the present fight against inflation does not warrant adop-





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# BRYANT

tion of new tax policies. For instance the most effective guard against inflation would be a special tax on consumers—but Treasury fears that once such a tax system were adopted it would be continued long after its justification had disappeared. The real cure for inflationary trends, Treasury believes, is expanded production of consumer goods. Present Treasury recommendations call for:

1—Reduction in government expenditures wherever possible, but after careful consideration for the reason that unwise economies would invite harmful results. Treasury is against any economies that would weaken our military potential.

2—Retention of present interest rates is desirable on the theory that a tight money policy would stimulate inflation and threaten stability of the government bond market. The maintenance of stability, Treasury feels, results in a degree of business confidence which is of tremendous value in achieving and maintaining full production—and thus shortening the period during which inflation will continue to threaten.

3—There should be no increase in taxes in the period immediately ahead, for the reason that the inflationary pressures will not be great enough nor sufficiently long-lasting to justify an added load on the American people. On the other hand, the size of the current budget does not warrant any reduction in the current tax load.

## Navy Ships To Be Redesigned

According to naval officers just returned from the atomic bomb tests at Bikini Atoll, a big job of redesigning naval vessels is ahead. So far major attention has gone to the ships themselves, and there are to be substantial changes in design of hulls, masts, structural members, armor, etc. Preliminary data, according to Vice Adm. W. H. P. Blandy, indicates also much redesign of valves, pumps, instruments, fittings and many other accessories which proved "brittle" under the shocks of atomic bomb attacks. In many cases a new study to determine the best materials of construction of such accessory apparatus will be launched. Manufacturers of such equipment and parts for the Navy probably will not get the new "atomic age" specifications before the latter part of 1947 and possibly not until 1948.

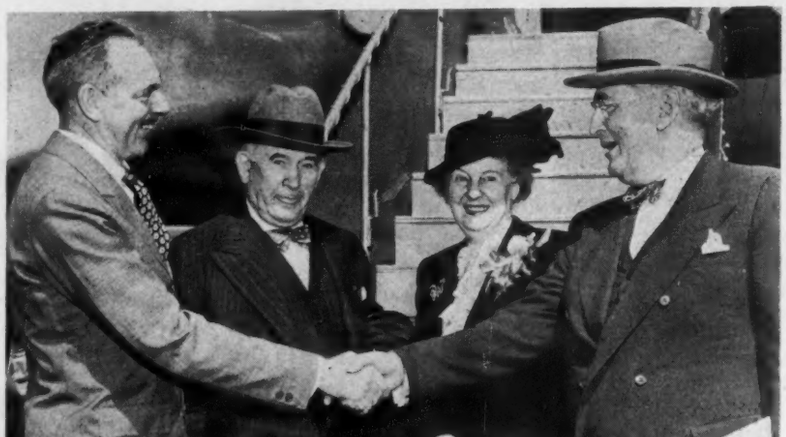
## FTC Ruling Questioned

Some Washington specialists in anti-trust law wonder whether the Federal Trade Commission overreached itself when it recently opposed the request of the United States Steel Corp. for clarification that would permit its subsidiaries to meet delivered prices of competitors.

If the commission's position is upheld by the courts, it would be legal to sell steel only on the fob mill basis plus the actual cost of transportation to points of consumption. Such a situation would cause a great uproar among steel buyers for, carried out to its ultimate effect, this policy would force a buyer to obtain his steel from the nearest mill—unless he was willing to pay a higher price to a less favorably located mill. It would destroy the time - honored method of equalizing freights under which the consumer can buy from any one of a number of producers at the same delivered price.

The tortured reasoning under which the commission has evolved some of its orders has been causing distress within the commission itself. This is attested by a sharp dissent by Commissioner Lowell B. Mason to the commission's order to the Standard Oil Co. of Indiana to desist from giving a special concession of 1½ cents a gallon to four large gasoline customers in Detroit. The commission majority held this concession is discriminatory against 358 smaller distributors in the Detroit area. It refused to consider Standard Oil's contention that denial of the 1½ cent concession would result in loss of the business to competitors.

Commissioner Mason accused the commission in this case as being squarely in opposition to Section 2 (b) of the Robinson-Patman Act which gives a supplier the right to meet a competitor's price. He found his fellow commissioners at fault in writing into the administration of the act a "social economic ideology of determining price by use" which was definitely and specifically rejected by Congress. Mr. Mason found no basis for the argument that the four large Detroit buyers should pay the same price as smaller buyers because they resold the gasoline partly at wholesale and partly at retail. An attempt to force a wholesaler-retailer to pay two different prices for gasoline, he declared—one price on the gasoline sold at retail and one price on that sold at wholesale—is contrary to the free enterprise system.



**PEACE CONFERENCE BOUND: Acting Secretary of State Dean Acheson bids farewell to Sen. Arthur Vandenberg as he left Washington Airport for the Paris Peace Conference. Left to right are: Dean Acheson, Sen. Alben Barkley, who was enroute to Switzerland via Paris to attend a meeting of the executive committee of the Inter-Parliamentary Union; Mrs. Vandenberg, who accompanied her husband; and Senator Vandenberg. NEA photo**

## Wartime Custom Prevails

Capital city observers who have nothing better to do note that the wartime custom of keeping the flag flying over the White House when the President is away still is the rule. This custom was started for security reasons when President Roosevelt made his frequent excursions to war plants and to foreign destinations. That the flag is flying merrily with President Truman vacationing in Atlantic waters, White House attendants say, is merely another indication that the war is not legally ended. The old custom of taking down the flag when the President is away will be resumed as of the date when the war is declared ended.

# Canada's Industrial Reconversion Is Three-Fourths Accomplished

*Completion of reconversion is expected by next spring. Modernization and expansion programs promise maintenance of a high level of employment and income. Delays in obtaining machinery and equipment retard resumption of peacetime production*

CANADA'S industrial reconversion from wartime to peacetime production is three-fourths accomplished now and is expected to be completed by the spring of 1947. By the end of 1946, the reconversion should be within 10 per cent of completion.

In announcing this progress, Canada's Economic Research Branch of the Department of Reconstruction and Supply said that the technical reconversion has been characterized by speed and comparatively little dislocation and that during the first postwar year manufacturing industries have shown a vigor not unlike that demonstrated during the war.

As an evidence of this vigor, the Economic Research Branch points to Canadian industry's programs of modernization and expansion designed to increase efficiency, to serve better the domestic consumer and to strengthen Canada's position in international trade. The large investment program planned by industry holds promise, the ERB said, of maintaining a high level of employment and income for the country in both 1946 and 1947, unless seriously interfered with by strikes and materials shortages.

### Unemployment Kept at Low Level

Despite the magnitude of the manpower shift between June 1, 1945, and June 1, 1946, when approximately 620,000 servicemen had been discharged and 720,000 persons released from war work, the number of unemployed was kept surprisingly low. It never reached more than about 270,000 out of a total working force of close to 4.8 million. The peak level of transitional unemployment was reached in March, and by that month, as the forces of expansion grew, unemployment had declined by 100,000.

From a survey of 643 plants, the Economic Research Branch determined that as a result of modernization and expansion the firms covered expected not only to maintain their employment but to increase it 3.4 per cent over the May 1, 1946, level. A little over half of the total increase was reported by plants which expected to complete their modernization and expansion programs by the end of 1946. However, present indications are that this increase will not be realized fully because of the retarding effects of labor unrest and materials shortages.

The survey showed that three-fifths of the plants engaged in reconversion activities were being retarded by various shortages, the most important of these being delays in obtaining machinery and other equipment. About half of the reporting plants had postwar plans for modernizing or expanding their facilities. Modernization programs were being undertaken in two-fifths of the plants and expansion programs in one-third of the plants.

Among the major industrial groups the number of plants requiring reconversion was proportionately greatest in the durable consumers' goods groups, such as automobiles, radios, washing machines, etc.

The incidence of modernization and expansion was highest in the durable consumers' goods group, mainly due to the need for those industries to introduce new technical devices and production methods which they were unable to adopt during the war. Most of the industries in the producers' goods and basic materials groups expanded greatly during the war years. Their main problem now, the Economic Research Branch said, is the consolidation of their wartime gains.

## U. S. and English Packaging Groups To Exchange Data

The Packaging Institute Inc., New York, and the Printing & Allied Trades Research Association, London, England, have made arrangements to exchange technical research data.

The British group through its packaging division maintains laboratories and library facilities to advance Britain's technical studies in all phases of metal, paper, glass and synthetic materials. These studies soon will be expanded through a recent grant from the British government.

The Packaging Institute, comprised of about 400 United States and Canadian firms manufacturing packaging materials and machinery and a large number of leading package users, does not maintain its own laboratory but conducts research through committees and advisory boards of both producers and users.

Future bulletins and publications of each group will be distributed among the two memberships.

**AGRICULTURAL MISSIONARIES: Members of the Church of the Brethren who will take American farming methods and mechanized farming equipment to famine-striken China are being instructed in the operation of a hydraulically-controlled weeder by Edward E. Range, in the tractor seat, an instructor at the Harry Ferguson Inc. educational farm in Detroit. NEA photo**

# British Iron and Steel Prices Rise

***Increases necessitated by advancing costs of production and transportation. Additional criticism of nationalization of Britain's steel industry comes from consumers and producers of tin plate. Shipbuilders at high rate of activity***

By J. A. HORTON
*Editorial Correspondent, STEEL*

*BIRMINGHAM, ENG.*

UNDER A NEW order issued by the Ministry of Supply maximum prices of the main qualities of pig iron have been increased by 4s 6d to 6s 6d per ton (90c to $1.30), and of heavy steel by 5s ($1.00) a ton. Prices of more finished products have been, where necessary, increased by amounts which reflect the increases in pig iron and semifinished steel as well as the advance in direct processing and delivery costs.

These adjustments follow an advance in coke prices only a few weeks ago to cover the extra cost of railroad transport. Business is not likely to suffer because of these changes. Iron and steel is urgently needed for the domestic market and for export although the allocations for the latter have been severely cut for the rest of this year.

New prices of a selected number of staple products follow:

Pig iron, 2.5 to 3.00% Si, dd. Middlesborough, £8 9s 3d ($34.02).

Pig iron, basic, all districts, £8 ($32.16).

Pig iron, hematite, dd. Scotland, N.E. & W. Coasts, £8 19s ($35.96).

Ferromanganese, standard grades, 78% Mn, £19 10s ($78.40).

Billets, basic soft, 100-ton lots, £12 17s 6d ($51.75).

Structural shapes, northern area and Scotland, £16 9s 6d ($66.22).

Boiler plates, £18 2s ($72.76).

Merchant bars, £18 8s ($73.96).

Galvanized corrugated sheets, 17/20 gage, £29 1s ($116.78).

Hard drawn wire, 6/8 gage, £24 ($96.48).

Rails, heavy, 60 lb & over, 500-ton lots, £15 12s ($62.70).

Figures released recently show the extent to which Britain imported ore and metal during the war and draw a vivid picture of the extent to which the war machine was kept going despite all the difficulties of blackout, bombing, shipping under perpetual enemy attack and ports under enemy bombardment. The dominions rallied to the help of the mother country, and the United States, under lend-lease made a notable contribution. Semifinished steel in the form of billets, blooms and slabs totaled 1,254,258 tons in 1940, increased to 1,362,295 tons in 1941. At that time Britain was receiving substantial tonnages from Australia, Canada, Belgium, Luxemburg and France. In the years that followed, the European sources were of course cut off, and in 1944 of the 693,533 tons brought to Britain 691,122 tons came from the U. S. The same applies to sheet bars and whereas in 1940 Britain bought 262,036 tons, in 1944 she purchased only 1705 tons, all of which came from America. In 1940, 1941 and 1942 basic pig iron was bought on a large scale, totaling for the three years 458,687 tons, 621,038 tons and 299,014 tons, respectively. In the first two years the tonnage was shared almost equally between India and the U. S., but by 1944 India was supplying 174,672 tons, and America, 45,224 tons. On a smaller scale many other products such as sheets, strip, plates, rods, wire, tubes and angles were also bought.

### Nationalization Criticized

More criticism of the government's proposals to nationalize the industry has come from consumers and producers in the tin plate industry. Sir Robert Barlow, chairman of the leading consuming concern, the Metal Box Co., has stated that the uncertainty was causing delay in the construction of new strip mills. E. H. Leaver, chairman of the biggest producing interest in South Wales, said plans for erection of the new mills were complex and delicately balanced and the government's decision threatened the foundations on which they were built. His company, Richard Thomas & Baldwins, was, however, endeavoring to start up as many old type tin plate mills as possible, but its restoration to the manufacture of tin plates and sheets was a slow process largely governed by the difficulty of obtaining necessary labor. This difficulty was accentuated by the reluctance of some employees to re-enter an occupation they felt had a limited future.

Tin plate exports from Welsh ports during the four weeks ended July 14 amounted to 4956 tons. A steelworks strike in the western area of South Wales which has been going on since July 26 has caused further delays in delivery.

## United Kingdom's Iron and Steel Output In July Lower than Second Quarter Rate

PRODUCTION of steel ingots and castings and pig iron in the United Kingdom in July, 1946, was somewhat higher than in the corresponding month last year but was under the rate prevailing in the second quarter of 1946.

Steel ingot and casting output in July of this year was at an annual rate of 11,759,000 tons, compared with 11,118,000 tons in July, 1945, and a rate of 13,111,000 tons in the second quarter of 1946. Pig iron production in July, 1946, was at an annual rate of 7,645,000 tons, compared with 7,010,000 tons in July, 1945, and 7,827,000 tons in the second quarter of 1946.

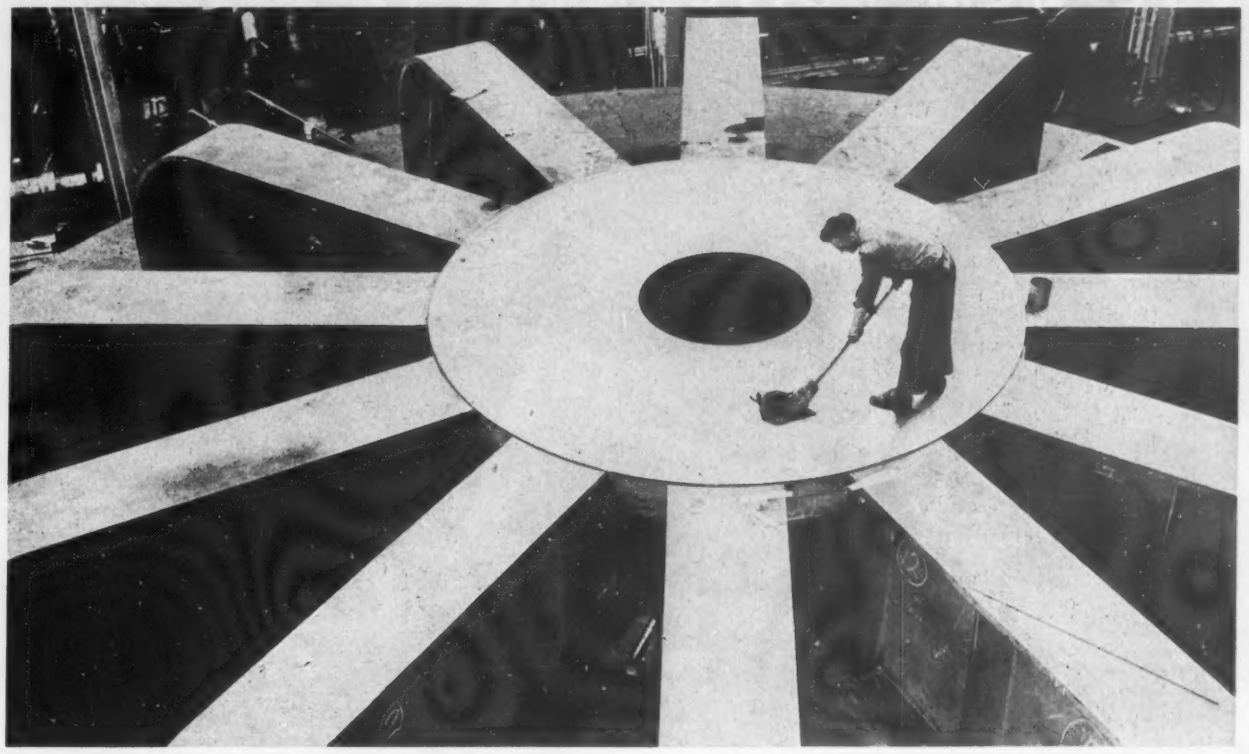
Production details are shown in the following tables:

**Steel Ingots & Castings**
(in tons)

| | 1946 | | 1945 | |
|---|---|---|---|---|
| | Weekly Average | Annual Rate | Weekly Average | Annual Rate |
| 1st Quarter ..... | 242 600 | 12,617,000 | 233,200 | 12,126,000 |
| 2nd Quarter ..... | 252.100 | 13,111,000 | 227,200 | 11.814,000 |
| July ..... | 226,000 | 11,759,000 | 213,800 | 11,118,000 |

**Pig Iron**
(in tons)

| | 1946 | | 1945 | |
|---|---|---|---|---|
| | Weekly Average | Annual Rate | Weekly Average | Annual Rate |
| 1st Quarter ..... | 145 500 | 7,566,000 | 134.500 | 6,992.000 |
| 2nd Quarter ..... | 150,500 | 7,827,000 | 132.600 | 6 894.000 |
| July ..... | 147,000 | 7,645,000 | 134,800 | 7,010,000 |



POWER FOR RUSSIA: Dwarfed by the size of this hydroelectric generator, a worker at General Electric Co., Schenectady, N. Y., is shown polishing the last of three which have been built for Russia's famed Dnieper Dam. The largest ever built, the generator weighs more than 2,250,000 pounds. NEA photo

# Adjustment of Wages in France Generally Accepted as Satisfactory

***Effect of higher rates on cost of living is awaited. August is quiet month industrially as most steel processing works close while workers take two-week vacations. Limited supplies of coal and coke hold French steel production back***

*PARIS*

THE PROBLEM of wages in France has now been settled by the government in a manner which is generally accepted as satisfactory. It remains to be seen what will be the effect of higher wages on the cost of living. The new level of wages would be of little use if prices were to rise to any considerable extent. The present minister of supply is doing all he can to bring about a lowering of prices of essential goods and to stop the ill effects of the black market, and it is thought that he may succeed as the harvest is very promising.

Coal, iron and steel production are showing little change. During August most of the steel processing works close down for a fortnight to allow workers to have two-week paid holidays; the month is therefore essentially a quiet one. The iron and steelworks are abundantly supplied with orders from every kind of processing works. Rolling mills are working to capacity and there is no need to solicit supplementary orders to enable a full program to be established as was the case often before the war. Actually there is a greater volume of demand than can be met. Deliveries extend to six to eight months for structurals and merchant bars, and to twelve months for plates and sheets. Some contracts, however, enjoy a priority, in particular those for the coal mines, and those covering equipment for the development of electric power.

Despite the considerable requirements of industry, steel output shows little signs of increasing because it is conditioned by available coal and coke supplies. Only one blast furnace at a time is being blown in in any works, and a second one only if coke supplies are sufficient to justify taking this step. There is no lack of iron ore or of scrap; in fact, stocks are abundant.

Coal thus remains the greatest obstacle to the expansion of steel output. Every means is employed to stimulate coal production or to find substitutes for its use. To attain this end, a vast program is being followed to intensify hydroelectric power. On the river Rhone a large dam, 330 feet high is expected to be terminated in 1947-48; it is planned to yield 450,000 kw. Another dam will be constructed on the river Isere. The mountain range of the Massif Central will also be put into use, and the "Bord" dam will soon be started on the river Dordogne; another on the same river but lower down is under way, and further ones are planned or under construction on the river Truyere.

American methods of construction are being used in the building of these dams, and schedules are being made to cover the purchase of the necessary materials and plant. These include Ingersoll perforators, Chicago Pneumatic and Sullivan equipment, Corway mucking machines from Chicago, cement guns from Pressweld of Pittsburgh, etc. Speed of realization is essential and the various engineering and purchasing missions that have visited the United States from France have been convinced of the efficacy and high efficiency of the plant and equipment manufactured in the United States.

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By A. H. ALLEN *Detroit Editor, STEEL*

# Mirrors of Motordom

***Automotive industry probably will lose money on every car built in 1946 even though assembly rates now exceed what once was considered the break-even rate. Little chance seen for betterment until government controls on suppliers are removed***

*DETROIT*

ANOMALIES like scarcity amid plenty, staggering corporate losses alongside record profits, shortages in the face of peak production and discontent in the most prosperous nation in the world are routine on the American scene today. To foreigners, as to many in the U. S., they just don't add up, yet there they are.

Consider just one strange phase, that of steady operating losses in certain companies concurrent with peak profits in others. The automotive industry, for example, continues to lose money on every car built and probably will continue to do so through the balance of this year, even though assembly rates now are well beyond what was once considered the break-even rate. The steel industry, operating steadily in the 90 per cent area, is doing little better than breaking even, is asking for and probably will get additional price relief. The railroads are running so far in the red they are suspending dividend payments and talking of canceling ambitious programs of rebuilding and re-equipment.

In sharp contrast to the motors, steels and rails are current financial reports of the large mercantile establishments, mail order houses, grocery chains and rubber companies, to name only a few. Thus, Sears Roebuck delineates sales of $639 million in 24 weeks prior to July 16, an increase of 52 per cent over a year ago, with profits up from $14 million to $38 million net after taxes. Goodyear Tire & Rubber shows first-half consolidated net earnings, after providing a $4 million reserve for foreign investments, of better than $15 million, the equivalent of $6.59 per share of common stock, against $2.90 per share earned in the same period a year ago.

Goodyear's consolidated net sales for the six months was nearly $283 million, compared with $408 million a year ago and $153 million in the first half of 1941. Tire production is at an all-time high rate of around 86 million annually, and next year's demand is estimated at 83 million. Yet there are new rumblings of labor discontent from Akron which may set the industry into a tailspin. And just try to buy a new tire at retail today.

Obviously the rubber companies are enjoying a market which requires little or no sales effort. There is no cut-throat price competition of prewar days. Tire prices are in many cases double what they were in 1941. The price of synthetic rubber is set by government fiat at 18 cents a pound, any production costs in excess of this amount being absorbed by the government.

The automotive industry is perhaps peculiar in that it is at the mercy of a labyrinthine network of suppliers which have been beset by the worst wage-price-strike infection imaginable. Result has been that where in normal times the ready availability of co-operative, and at times even submissive, group of vendors was an important factor in the good profit performance of the automotive industry, today the situation is just the reverse. Until all government controls, except on taxes, are dropped from this segment of U. S. manufacturers there is little chance of any betterment. Union leaders, incidentally, might well ponder the perilous position in which their memberships are placed as long as their employers continue to operate at a loss. Rather than scream at profits which are not there, they might profitably raise their public voice—and it is no faint one—in the effort to make profits possible.

## Automobile Production

**Passenger Cars and Trucks—U. S. and Canada**

*Tabulated by Ward's Automotive Reports*

| | | |
|---|---|---|
| **January** | **121,861** | **524,037** |
| **February** | **83,841** | **509,332** |
| **March** | **140,777** | **533,878** |
| **April** | **248,318** | **489,856** |
| **May** | **247,620** | **545,321** |
| **June** | **214,511°** | **646,278** |
| **July** | **334,500°** | **468,897** |
| **August** | **360,500°** | **164,793** |
| **Estimates for week ended:** | | |
| **Aug. 10** | **77,825°** | **41,795** |
| **Aug. 17** | **88,990°** | **45,550** |
| **Aug. 24** | **91,620°** | **45,525** |
| **Aug. 31** | **70,000°** | **39,965** |

**°Preliminary.**

## Auto Sales Increasing

For the record, it might be mentioned that factory sales of passenger cars for the first seven months of the year were 30.7 per cent of sales recorded the same period of 1941, totaling 849,804. July shipments were 60.9 per cent of the 1941 figure, and August will top the same month five years ago, but only because of the model changeover in the latter period. Truck sales compared more favorably in the first seven months, being 63.7 per cent of the 1941 figure. Total for all types of vehicles was 37.1 per cent of the 1941 level.

## Foreign Market Cultivated

An interesting postscript to these figures is the extent of shipments to foreign markets. In the seven months under consideration 51,462 passenger cars and 83,059 trucks and commercial cars were moved out of the country, representing 6 per cent and 24 per cent, respectively, of total factory sales. These figures are close to prewar averages—7 per cent and 21 per cent respectively—for passenger car and truck exports, indicating special efforts are being made to hold on to this country's top position in foreign automotive markets.

Foreign competition for this big chunk of U. S. trade, by the way, is being sharpened to a keen edge. Britain, particularly, is planning the export of an unusually large proportion of her motor car production, in fact, has already started such shipments. Other countries have similiar programs in the formative stage. Australia, for example, is stepping up production facilities for car production, some of which will be directed by American companies.

General Motors Holdens Ltd. in Melbourne is drawing up plans and buying production equipment for additional plants to build a light 6-cylinder model, along the lines of the Chevrolet. Hand-built versions are being put together in Detroit now for subsequent testing and transfer to the Australian operation.

## Defiance, O., Gets Foundry

Defiance, O., has been selected as the site of the new gray iron foundry to be erected by the Central Foundry Division of General Motors, winning out over Tiffin, O., by a margin of 3126 to 2625 in applicants for prospective employment. Survey work on the plant site has begun and it is hoped that ground can be broken in 60 days. The larger number of applicants in Defiance was not the sole factor in deciding to locate the plant there. Consideration was given to which area could best supply the necessary 2000 working people without disturbing community life in general, other

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**LAND CRUISER: This luxurious 4-room, 30-foot long air-conditioned land yacht was built by Linn Truck & Coach Corp. for Dr. H. J. Sealey of Dumont, N. J., right. At left is A. R. Perkins, president of the Linn firm. The 7-ton vehicle is powered by a 6-cylinder 125 horsepower Hercules engine and is capable of speeds up to 75 mph. It was built at a cost of $20,000. NEA photo**

manufacturers and local transportation.

## Dodge Announces New Trucks

Three new heavy-duty trucks, each available in ten different models, have been announced by the Dodge truck division. They are to be built in 60 gross vehicle weight classifications up to 23,000 pounds and in tractor-trailer ratings up to 37,000 pounds. Engines powering the new heavy-duty units are based on designs developed for trucks built during the war for service on the Burma road, and embody such features as chrome-nickel-molybdenum iron cylinder blocks, aluminum alloy pistons with steel struts to control skirt expansion, four piston rings with the top one chrome plated, seven crankshaft bearings of the steel-back, copper-lead and lead-tin multiple layer type, induction hardened crankshaft journals, sodium cooled exhaust valves stellite-faced and seating in stellite inserts, three-piece slip-joint exhaust manifold, multiple-valve fuel pump, etc.

## Union Trouble Forestalled

The Ford industrial relations department has forestalled probable trouble from the UAW-CIO in its campaign to obtain increased vacation payments for veterans, by relaxing vacation eligibility rules to grant credit for prewar service to those who were laid off at Ford plants when civilian production was halted. Indicated increase in vacation benefits is around $300,000.

The union's current campaign is directed chiefly at General Motors, and a test suit has been filed with a federal district court in behalf of a GM employee. Several weeks ago a group of about 100 veterans carried out a few "squads right" and "squads left" in front of the GM plants in Pontiac, carrying placards demanding extra vacation pay, with the result that a full day's production of 13,000 was lost because of the refusal of workers to go to their jobs while the veterans were "picketing." The stunt had all the earmarks of a carefully engineered publicity move by the union, and was so characterized by H. W. Anderson of General Motors. However, the union immediately disclaimed any responsibility, saying it had advised the veterans against the demonstration and ignoring the fact that in original contract negotiations it had rejected a plan whereby such veterans would have received the vacation pay they sought.

## Ford Awards Plant Contract

Ford has announced award of contract to F. H. McGraw & Co. for purchase and installation of new production equipment in an assembly plant being built at St. Louis. The contract totals over $3 million and marks the first time Ford has placed a single order for purchase and installation of all equipment in an assembly plant with an outside interest. Most of the work will involve spray booths, welding equipment, steam ovens, infra-red drying ovens and accessory equipment. The plant is designed to assemble 500 Ford and Mercury passenger cars and Ford trucks daily; it will employ 3000.

## Packard To Ask Rehearing

Action of the U. S. Circuit Court in Cincinnati in deciding by a vote of two to one that foremen at the Packard Motor Car Co. are in the front line of management in their relations with rank and file workmen but are employees under the National Labor Relations Act in their relations with management and hence entitled to organize and bargain collectively, was not unexpected in these days of double talk in high places. The Packard management has decided to petition the court for a rehearing and, if denied, will seek to have the issue reviewed by the U. S. Supreme Court.

Dissenting opinion of Judge Simons is worth repeating in part. He stated: "Up to the present case, the labor board had held in a long series of decisions that foremen do not constitute an available unit for collective bargaining. The basis for departure from earlier decisions is that dangers previously apprehended have not materialized. We are concerned, however, with the interpretation of a statute and now the making of a policy. Congress formulates policy and the court's function is to ascertain the congressional purpose from the terms of its enactment.. . . . ."

## Nash Production Delayed

Suppliers' strikes and materials shortages have delayed postwar production at Nash by at least six months, according to estimates of manufacturing officials. Latest suspension has been the company's Ambassador models, occasioned by a shortage of intake manifold castings. Nash produced 61,897 cars from V-J Day through Aug. 21, instead of the planned 108,795. Present assemblies average about 350 a day, compared with a planned output of 800 daily.

## Amplex Gets New Equipment

Amplex Division of Chrysler Corp. has installed additional presses and sintering equipment for handling powdered metal parts weighing over 100 lb and as large as 20 in. in diameter. Equipment formerly was limited in general to parts of less than 8 sq. in. of area. Largest cylindrical block of powdered metal made to date weighed 233 lb.

## $715 Million Road Program

Despite shortages of material, labor and equipment, postwar highway construction to repair the country's roads and to build new ones now totals $400 million, according to Charles M. Upham, engineer-director, American Road Builders' Association.

Estimated state and federal-aid programs to be placed under construction this year will bring the total to $715 million, which tops the government's estimate of $500 million of road building in 1946, and with some of the bottlenecks removed this year, a marked increase in highway construction can be safely predicted for 1947, Mr. Upham said.

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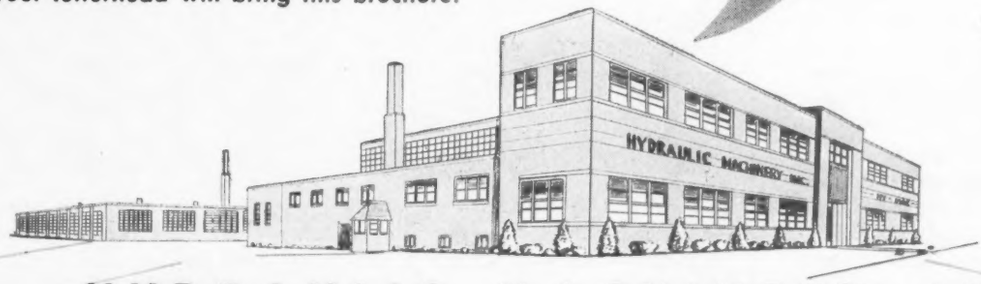


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# Employment Shows Steady Rise Despite Reconversion Problems

***Needs for workers in San Francisco area have not been filled and are not likely to be soon. Employment of additional numbers of people to overcome loss in production resulting from lack of worker efficiency helps put heavy drain on labor pool***

*SAN FRANCISCO*

AFTER slightly more than a year of peacetime production, hampered as it has been by reconversion problems, material shortages, etc., perhaps the most noteworthy industrial trend in the San Francisco area—as well as on the whole West Coast—has been the constant rise in employment.

By this time, forecasters who a year ago were predicting a slump in manpower needs have long since been outcountenanced and all their theories disproved. On the basis of an informal survey of employment conditions in the San Francisco area, it now can be said that employers' needs for workers not only have not been fulfilled, but are not likely to be filled soon.

Demand for manpower varies, of course. Larger firms are in a relatively better position than smaller companies, but manufacturers in general have a greater need than nearly any other type of industry.

A sample poll of companies, designed to provide a cross section of overall labor needs, shows that three-fourths of this section's industries intend to continue recruiting workers. Nearly every company surveyed has a need for skilled men, some in great degree, others to a lesser extent.

### Labor Pool Dwindles

Meantime, the available labor pool from which employers can draw men is dwindling steadily. Currently, of those able and willing to work, less than 25,000 are unemployed in San Francisco. About 17,000 of these have applications for jobs on file with the U. S. Employment Service. Actually, however, to say there are 25,000 "unemployed" is a fiction. A large proportion of that number is unemployed only temporarily. What their present status amounts to is that they are seeking to change jobs.

This problem of turnover still is a serious one for many San Francisco firms. It appears to be a natural corollary of the reconversion period. During the past year, thousands of shipyard workers have had to find new jobs, for example. Many of these, when the yards closed, took the first jobs that were offered in other industries. Before long they found that either the work did not suit them or they did not suit the work. Hence, there began a drifting from job to job. This trend still is continuing and may be a factor for some months yet. Eventually, the bulk of workers will settle down.

Then, too, the same thing is true of veterans, who also are experimenting with newly found trades and skills acquired in the services. Many veterans still are changing jobs with a greater than normal rapidity.

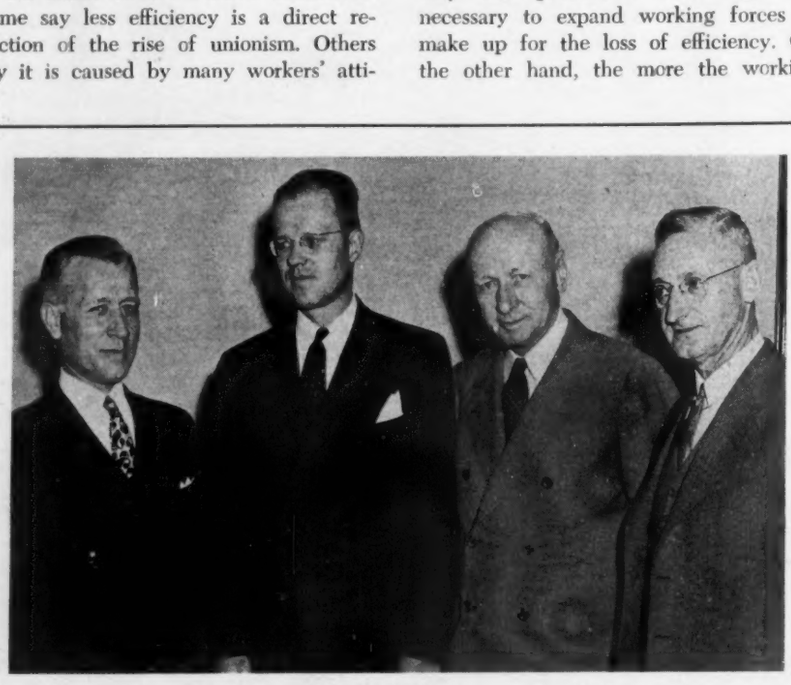
One factor that is having a direct influence on the employment situation is a decline in worker efficiency in terms of production units. In about 70 per cent of the factories surveyed, efficiency was reported to be below normal. Some factories estimated it 65 per cent below prewar standards.

There are a number of reasons for this. Many employers tend to place most of the blame on the workers themselves. Some say less efficiency is a direct reflection of the rise of unionism. Others say it is caused by many workers' attitude of "the world owes me a living." In some places it is attributed to inexperience of workers, and over-classification or upgrading above what is considered normal levels of ability. Some employers believe that worker efficiency will improve when the workers gain experience. Right now, they point out, production has to be sacrificed because so many men are being trained.

One factor which often is overlooked by many employers, however, is that a decline in efficiency is a mechanical rather than a human fault. It is pointed out that most factories came out of the war with machines and equipment in poor condition after six years of hard usage.

Up to now it often has been difficult or impossible to increase, replace or repair equipment because of material and parts shortages. Once the physical side of industry is put into good working order, it is believed there will be a corresponding increase in efficiency.

Meanwhile, employers faced with that condition are on a spot. In order to keep production at an efficient level they have to hire more workers. For instance, it may take ten men to produce 100 units in 1946, whereas in 1939 100 units could be produced by six men. So if production is to be kept at a high level, and thus provide profit margins that only mass production can bring, it is necessary to expand working forces to make up for the loss of efficiency. On the other hand, the more the working



GE OFFICIALS AT HANFORD: Ralph J. Cordiner, left, vice president, General Electric Co., inspects the Hanford Engineering Works at Richland, Wash., management of which was taken over on Sept. 1 by GE. The $347 million atomic energy project had been operated by E. I. du Pont de Nemours & Co. Other GE officials shown include, left to right: J. F. Gogins, manager, Spokane office; A. S. Moody, commercial vice president; and Clarence Champ, manager, Butte, Mont., office

force is raised, the higher the costs, especially as labor is the major expense in nearly every type of manufacturing enterprise. Naturally, this squeeze can't go on getting tighter and tighter.

Among San Francisco firms in greatest need of workers, especially skilled men, are companies grouped as metal fabricators. The metal trades industry, excluding shipyards, now employs more than 50,000 persons, and the industry expects to add more than 5000 workers by the end of the year.

## WAA Reoffers West Coast Steel Tubing Property

Widespread interest in the disposition of a steel tubing plant in Los Angeles, built by the government and now being operated under temporary lease by the Pacific Tube Co., has resulted in the facility being reoffered for sale by the War Assets Administrator. All previous offers to buy the property were rejected by WAA on Aug. 20 when the bids were opened.

The plant is expected to participate in a substantial way in the industrial steel expansion of the West. The site, which includes mineral rights, is located in the recently discovered Vail oil field where some profitable wells have been drilled. The plant and oil and mineral rights in the oil field are being offered separately.

## Construction Permits Total $133 Million in Los Angeles

*LOS ANGELES*

A total of $133,142,000 worth of building permits were issued in Los Angeles during the first six months of this year, statistics from federal bureaus disclose.

Comparatively, in New York City there were $70,265,000 in permits; in Detroit, $69,183,000; in Chicago, $68,902,000.

During June, new construction started in Los Angeles amounted to $19,056,551. In additions, alterations and repairs the total was $2,433,000 that month.

Los Angeles ranked fifth, however, in the construction of factories, according to permit statistics. In June, papers were issued for $1,190,000 worth of such industrial building.

## Operations To Be Started at Troutdale Aluminum Plant

*PORTLAND, OREG.*

Operations at the Troutdale aluminum plant are to be started the first week in September by the Reynolds Metals Co. The plant has been closed for about a year.

# Sale of Government-Owned Steel To Export Firm Halted by Navy

***Delivery of 5000 tons of steel stockpiled at Port Hueneme, Calif., is said to have been stopped because of complaints to Washington that Argentina should not receive scrap that is vitally needed for domestic furnaces***

*LOS ANGELES*

A STOCKPILE of more than 5000 tons of steel lying at Port Hueneme, near Los Angeles, last week was the focal point of a tug-of-war between southern California steel mills, the Navy, various dealers, civilian government agencies and an export firm which would send part of the material to Argentina.

P. W. Keen, executive secretary of the Institute of Scrap Iron & Steel, southern California branch, disclosed that the Navy first declared the tonnage, mostly pontoon parts, to the War Assets Administration as salvage. When it did not sell in that form, it was taken over as scrap by the Navy. It was then offered on bids from local consumers and dealers.

Mr. Keen, as well as mill representatives in the area, pointed out that in the subsequent bidding potential buyers were limited to the OPA ceiling price of $13.48 a net ton. At the same time a Hollywood export firm, buying for foreign shipment, was able to bid $1.31 per ton over the OPA price and was awarded the material.

Shortly thereafter, in a sudden reversal of policy, the Navy Bureau of Supply in Washington halted delivery to the export firm. All bids were then ordered destroyed.

### Classifies Parts as Salvage

Comdr. J. L. O'Brien of the supply office at Port Hueneme told a STEEL reporter that the Washington bureau made its reversal after noting the sale in an official catalog and based its new finding upon the fact that the steel should be offered as salvage instead of scrap.

An official at the Los Angeles WAA office said that he "had no knowledge" of any offering of the pontoon parts as salvage by that agency.

To both these statements, Los Angeles executives contacted by STEEL took exception. The real cause of the halting of delivery lay in complaints made to Washington to the effect that Argentina should not receive scrap so vitally needed for domestic furnaces, they asserted. In addition they pointed out the inconsistency of one federal agency selling for export while the Civilian Production Authority and other bureaus are currently pushing the collection of scrap for the benefit of many furnaces already shut down.

One southern California mill representative with an avowed 10 days' supply of scrap on hand declared that the relatively small amount of steel at the port is unimportant in itself.

## Boeing Company Develops Huge New Cargo Airplane

*SEATTLE*

Development of a double-deck, four-engined Stratofreighter, an all cargo airship, has been announced by William M. Allen, president, Boeing Aircraft Co. This plane has been designed to meet demands of an expanded air cargo field through efficient, low cost operation.

The new type is a sister ship of the 80-passenger Stratocruiser, 49 of which are on order for five major air lines. The 67½-ton Stratofreighter will carry a maximum pay load of 41,000 lb at speeds of 300 to 350 mph. It will be powered by four 3500 hp engines. The plane will have a volume nearly twice that of an average box car and its speed will enable it to cross the continent 20 times while the railroad box car is making one trip.

Among outstanding features in the new plane are the cargo compartments, each separately accessible and each equipped for rapid loading and handling. By means of an electric hoist cargo may be lifted from trucks or directly from the ground.

The Boeing-designed altitude conditioning system has been incorporated into the design. This maintains sea level conditions at all altitudes up to 15,000 feet and 6000-foot conditions at 25,000 feet. Advanced heating system and refrigeration are included in the plan.

General Electric turbo-superchargers will be included in the power plant installation, the first installation in a commercial cargo airplane. The turbines assist in attaining decreased operating costs and increased ranges by saving as much as 14 per cent in fuel consumption.

A twin-engined, high wing ship, Boeing 417, has been ordered into production at the company's Wichita, Kans., division. This ship is designed for feeder line service to small communities.

# Sheffield Corp. Purchases Tap And Die Firm

*Acquisition of Threadwell Tap & Die Co. adds line of small tools to Sheffield's gages and machine tools*

AS ANOTHER step in its long term expansion program, Sheffield Corp., Dayton, O., has purchased the plant, equipment and business of Threadwell Tap & Die Co., Greenfield, Mass. According to officials of the Sheffield firm, no changes are contemplated at present in the operations of either plant. However, the acquisition provides for possible future expansion in the tool and die industry.

Threadwell, which was organized more than 40 years ago and is the outgrowth of several small tool companies, produces small perishable tools. In recent years it has been retooled with thread grinding and hardening machinery. None of its products compete with those made by Sheffield, and its line will complement that of Sheffield.

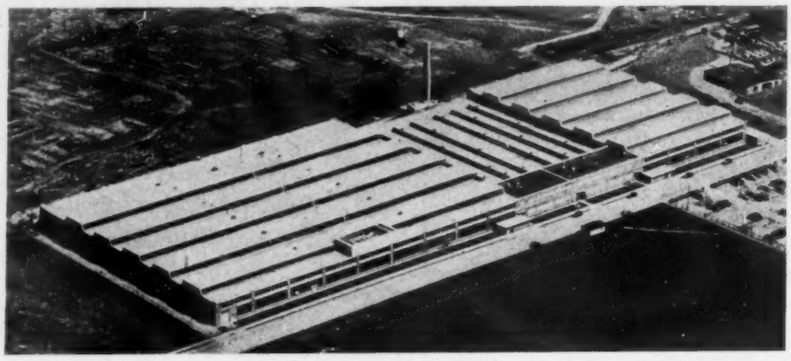
Officers of the Threadwell company include Herbert J. Smith, president; W. B. du Mont, vice president in charge of sales and chairman of the board; and William Scott Keith, secretary-treasurer and principal stockholder, who is understood to be resigning in order that he can devote his full time to other business interests.

The Sheffield Corp., which was organized in 1941 as a result of a merger of a Dayton tool company and the Sheffield Machine & Tool Co., is headed by the following officials: Louis Polk, president; John Bernard, vice president and general manager; C. H. Reynolds, Albert F. Polk and Paul W. Polk, vice presidents; Edward T. Noe Jr., secretary; Oscar A. Ahlers, assistant general manager; and R. F. Whisler, assistant treasurer.

Sheffield has four main divisions manufacturing gages, precision measuring instruments, and machine tools, and providing a contract engineering and manufacturing service.

## New Plant To Make Brass Plumbing Products Planned

American Radiator & Standard Sanitary Corp. has announced plans to build a $3.5 million plant in Richmond, Calif., on the east shore of San Francisco Bay. The new factory will manufacture brass plumbing products and will employ more than 1000.



**BUYS WAR PLANT: Chain Belt Co., Milwaukee, has purchased this heavy ordnance plant that had been constructed in 1943 in West Milwaukee for the Defense Plant Corp. The one-story structure containing 317,000 sq ft of floor space is to be used in the manufacture of chain belts and construction machinery**

# BRIEFS . . .

*Paragraph mentions of developments of interest and significance within the metalworking industry*

**Lake Erie Engineering Corp.**, Buffalo, has acquired Feller Engineering Co., Pittsburgh, manufacturer of hydraulic extrusion presses, and will operate it as Feller Engineering Division with headquarters in the Empire Bldg., Pittsburgh.

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**Chiksan Co.**, Brea, Calif., has acquired Well Equipment Mfg. Corp., Houston, Tex., which will be operated as a wholly-owned subsidiary.

—o—

**Air Materiel Command**, Wright Field, O., is compiling a 75,000 word German-English dictionary which is designed to clarify German aeronautical words, phrases, idioms and slang as an aid in understanding captured German documents.

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**Koppers Co. Inc.**, Pittsburgh, has purchased for $1,500,000 from War Assets Administration the plant adjacent to its American Hammered Piston Ring Division plant in Baltimore and will use the facility to increase its capacity for automotive and industrial piston rings.

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**Pittsburgh Coal Co.**, operating unit for 18 coal mines of Pittsburgh Consolidation Co. in Pennsylvania, is moving its headquarters from the Oliver building in Pittsburgh to Library, Pa., 14 miles south of Pittsburgh. The change is being made to place executives as near the actual site of operations as is convenient. Pittsburgh Consolidation's headquarters remain in Pittsburgh.

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**Carnegie-Illinois Steel Corp.**, Pittsburgh, is to manufacture steel for an atom smashing cyclotron magnet to produce five times the maximum energy of any now operating. The cyclotron magnet will be built at the University of Rochester, Rochester, N. Y.

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**Cooke & Ferguson Ltd.**, Manchester, England, has been granted manufacturing and distribution rights in the British Isles for the automatic stud welding equipment and flux-filled studs made in this country by Nelson Specialty Welding Equipment Corp., San Leandro, Calif., and Nelson Stud Welding Corp., Lorain, O.

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**McNally Pittsburg Mfg. Corp.**, Pittsburg, Kans., has completed a coal preparation plant in Brazil for Companhia Siderurgica Nacional, Rio de Janeiro.

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**Federal Shipbuilding & Dry Dock Co.**, Kearny, N. J., subsidiary of United States Steel Corp., has completed a $250 million emergency warship building program in the Navy's yard at Port Newark, N. J. Federal will continue in charge of the property which will be used as a Navy storage yard and berthing area.

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**American Locomotive Co.**, New York, will complete its 75,000th locomotive in September. The company's first locomotive was built at Paterson, N. J., in 1837.

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**Carboloy Co. Inc.**, Detroit, has appointed Arthur A. Crafts Co., Inc., Boston, as distributor for Boston, eastern

Massachusetts, southeastern New Hampshire and Maine.

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**W. B. Connor Engineering Corp.,** New York, has appointed the following as representatives: O. K. McCullough Co., Kansas City, Mo.; Products Inc., Des Moines, Iowa; and Russell J. Smith, 1601 S. Grand Blvd., St. Louis.

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**Belfort Corp.,** Baltimore, plans to establish a branch plant to make kitchen cabinets and other kitchen equipment at Arthurdale, W. Va., where it has acquired three buildings.

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**Forker Corp.,** Cleveland, has purchased a factory at 2044 Random Rd., Cleveland, as part of its expansion program.

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**Federal Telephone & Radio Corp.,** Nutley, N. J., has completed two laboratory buildings whose walls are made of glass fiber, steel and aluminum as insulation against atmospheric electricity which might interfere with the company's experiments.

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**Metal Slitters Inc.,** Baltimore, recently organized, is equipping a two-story building for the slitting of all types of metals. The company plans to add a metal tinning department soon.

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**Aircraft Division, Weber Showcase & Fixture Co.,** Los Angeles, has leased the building formerly occupied by Toolcraft Mfg. Co., Los Angeles, for a five-year period and plans to purchase $50,000 worth of new equipment.

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**Lukens Steel Co.,** Coatesville, Pa., has erected a gigantic fluorescent sign measuring 87 feet wide and 34 feet high adjacent to its plant. The sign is made of porcelain enameled pressed steel letters affixed to a steel framework.

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**A. Finkl & Sons Co.,** Chicago, has purchased for $150,000 from Reconstruction Finance Corp. the plant in Chicago which it operated during the war to produce die blocks for the Army Air Forces.

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**De Laval Aircraft Gas Turbine Division, De Laval Steam Turbine Co.,** Trenton, N. J., has been awarded what is said to be one of the largest government-sponsored aircraft gas turbine experimental projects in the country.

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**Warren Belting Co. Inc.,** Worcester, Mass., recently incorporated, has bought Warren Belting Co., that city, and will continue to make leather belting and specialties.

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**Bunell Machine & Tool Co.,** Cleveland, has established a tool and die engineering service to advise manufacturers on special machine designs.

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**Cleveland-Cliffs Iron Co.,** Cleveland, has installed marine radar equipment in its Great Lakes' fleet flagship, *William G. Mather.* The equipment was built by Westinghouse Industrial Electronics Division, Baltimore.

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**Wheelco Instruments Co.,** Chicago, has named Farnes & Martig Inc., Portland, Oreg., as sales representative for Oregon.

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**Hays Corp.,** Michigan City, Ind., has appointed Illes & Larkin Co., Cleveland, as exclusive representative in the Cleveland area.

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**Swiss Automatic Co.,** Marysville, Mich., has moved into its new plant and has added a Brown & Sharpe automatic screw machine department.

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**Patch & Talmage,** Stamford, Conn., recently formed, is offering a complete range of consulting services in the field of powder metallurgy.

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**Midwestern Metal Corp.,** Kokomo, Ind., has been formed and will manufacture flat wire. Officers are: Earl Orem, president; Russell Nolan, vice president; and Mrs. Eva Orem, secretary.

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**H. K. Porter Co. Inc.,** Pittsburgh, has acquired Brake Equipment & Supply Co., Chicago.

—o—

**Penflex Sales Co. Division,** Pennsylvania Flexible Metallic Tubing Co., Philadelphia, has opened a branch office at Loew Theater Bldg., Syracuse, N. Y.

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**Baltimore Castings Corp.,** Baltimore, has bought from War Assets Administration for $600,000 the magnesium foundry operated during the war by Maryland Sanitary Mfg. Corp., that city. The company will manufacture soil pipe and fittings.

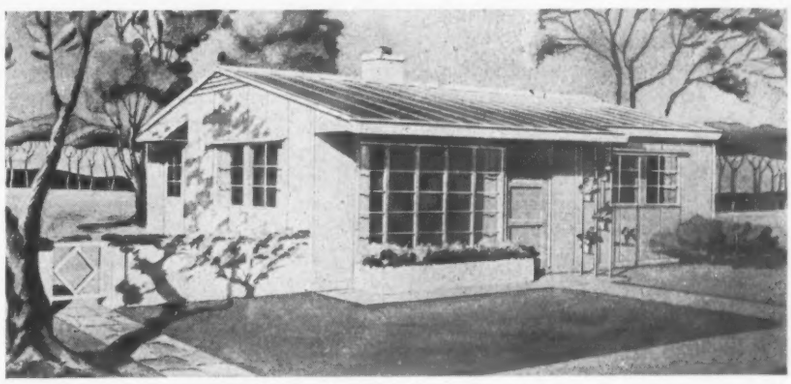
## Bethlehem Steel Co. Gives Contract to Rust Furnace Co.

Bethlehem Steel Co., Bethlehem, Pa., has awarded the Rust Furnace Co., Pittsburgh, a contract to design and construct three continuous triple-fired slab heating furnaces.

Costing more than $750,000, the furnaces are to be built for the new 66-in. strip mill at Bethlehem's plant at Sparrows Point, Md. The new units will have an effective heating length of 90 ft with an inside width of 24 ft 6 in. Each furnace will have a capacity of 110 tons of steel an hour heated from cold to the rolling temperature of 2250 F.

## Westinghouse Enters Bid For Vanport, Pa., Plant

Westinghouse Electric Corp., Pittsburgh, has made a bid for the huge former Curtiss-Wright propeller plant at Vanport, Pa., as a major project in its expansion program. If the bid is approved, Westinghouse plans to manufacture small de-ion circuit breakers at this plant and will probably employ about 2000 people. The plant was built in 1941 at a cost of about $5 million. It contains 360,000 square feet.



NEWEST IN HOUSING: This new model prefabricated metal house just introduced by the Steelcraft Mfg. Co., Cincinnati, is designed for ease and speed of construction as well as comfortable living space. Called the "Roselawn," this completely insulated house has an all metal structural frame with stuccoed exterior finish and aluminum roof. It can be erected in 125 man hours by inexperienced men. Cost will be between $3000 and $5000

# Men of Industry

DOUGLAS L. DARNELL

R. K. CLIFFORD

I. B. ANDERSON

**Douglas L. Darnell** has been elected vice president in charge of sales, Baker-Raulang Co., Cleveland. Mr. Darnell joined the company's sales staff immediately following World War I, and became sales manager in 1936.

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**E. J. McGehee** has been appointed sales manager, Koppers Co. Inc., Pittsburgh. Mr. McGehee, who is vice president of the company, in his new capacity will co-ordinate Koppers sales activities on a companywide basis. He joined the company in 1934, and was appointed vice president in 1941. Prior to joining Koppers, Mr. McGehee was a production and sales executive of Ayer & Lord Tie Co., which subsequently was purchased and merged with the Koppers Co.

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**John W. Adelung** has been appointed district manager of the White Plains, N. Y., branch, Mack Trucks Inc., New York. He had been New York and New England regional director of the Office of Defense Transportation. **Dwight R. Collin** has been appointed personnel director, Mack Mfg. Co., subsidiary of Mack Trucks Inc. Since 1935, Mr. Collin had been with the New York law firm of Chadbourne, Wallace, Parke & Whiteside.

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**L. T. Wright** has been appointed sales manager, Bunell Machine & Tool Co., Cleveland. Mr. Wright is an engineer, and a member of American Society of Tool Engineers, and American Institute of Electrical Engineers.

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**R. S. Slater** has been appointed manager of tank car sales, American Car & Foundry Co., New York. He will be in charge of sales of tank cars, storage tanks and pressure vessels. Mr. Slater started his career with ACF in 1923 as expediter in the Material Assembly Division of the purchasing department in New York. In 1935 he transferred to the sales department, and in 1936 was appointed sales agent in the New York sales department.

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**D. A. Williams** will retire at the close of the present year as president, Continetal Steel Corp., Kokomo, Ind. On Jan. 1, Mr. Williams will become chairman of the board of directors, an office which has been vacant since the death of **J. E. Frederick. R. K. Clifford** has been chosen to succeed Mr. Williams as president of the corporation. Mr. Williams became vice president in 1927 of the then newly formed Continental Steel Corp. He has been president of the organization since 1931. Mr. Clifford was named vice president in charge of operations of Continental in 1939, director in 1941, and general manager in 1944.

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**August A. Bolik,** for the last 20 years district manager of the Cincinnati and Dayton, O., sales offices of E. W. Bliss Co., Brooklyn, N. Y., has resigned to take charge of the Dayton office of Henry F. Smith & Son, Cincinnati, exclusive sales agents for Federal Machine & Welder Co., Warren, O., and subsidiaries, Warren City Mfg. Co., Warren, and Sommer & Adams Co., Cleveland.

—o—

**Ray D. Cunningham** has been appointed director of sales, Nox-Rust Chemical Corp., Chicago. He had been general sales manager, Wolf's Head Oil Refining Co., Oil City, Pa. During the war years, he was manager of the rust preventive and protective coating department, Kendall Refining Co., Bradford, Pa. **W. F. Costello Jr.** has been named eastern sales manager for government and marine sales for the Nox-Rust corporation. Mr. Costello had been manager of sales and technical services, Eastern Division, Inter-Coastal Paint Corp., East St. Louis, Ill.

—o—

**I. B. Anderson** has been appointed manager, Stainless Steel Division, Jessop Steel Co., Washington, Pa. Mr. Anderson has been associated with the steel industry for 24 years. He joined Jessop in 1945. Prior to that, he was with Carnegie-Illinois Steel Corp., Pittsburgh.

—o—

**John O. Forster** has been appointed chief engineer, Aircraft Screw Products Co. Inc., Long Island City, N. Y. He was formerly chief engineer for Bulova Watch Co., New York, where he was responsible for research and design of aircraft accessories during the war years.

—o—

**R. W. Loudon** has been elected president of Barn Equipment Association, Chicago, succeeding H. B. Morgan. Mr. Loudon had been vice president of the association. **F. E. Myers II** has been elected vice president of the organization, and **R. C. Hudson**, treasurer. **B. J. Higgins** has been named to the executive committee, succeeding **F. G. Wells.**

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**K. P. Swanson,** Abington, Mass., has been appointed to represent Progressive Welder Co., Detroit, in eastern Connecticut, eastern Massachusetts, Rhode Island, Maine, Vermont and New Hampshire.

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**Charles J. Ramsburg Jr.** and **Eugene F. Conroy** have been appointed assistant district managers of the New York office, Spang-Chalfant Division, National Supply Co., Pittsburgh. **Edwin A. Booth** has

When mill-ordered Armco steels are unloaded in your plant you can be sure of this:

The steel is "job-tailored" to your needs—*before* and *during* rolling operations. Salesmen, metallurgists, and mill representatives all see that you get the *one right steel* for your products.

For almost 20 years Armco men have called this "Q. C."—Quality Control. Metallurgists who study your requirements specify the analysis of steel, the temper rolling, annealing, and all other operations that affect the qualities of the finished sheets. Then mill operators follow through with these instructions on your individual routing card.

In recent years, Armco control charts and statistical analyses have further helped to assure consistent production of prime steels. They are an added safeguard for the sheets that go into your products.

"Quality Controls" like these are one reason why leading manufacturers look first to Armco for special-purpose sheet steels.

Back of it all are the research and experience that contribute to a higher "Q. C." at our end and better quality at yours. The American Rolling Mill Co., 3701 Curtis St., Middletown, O.

ARMCO

**The American Rolling Mill Company**

**Special-Purpose Sheet Steels • Stainless Steel Sheets, Bars and Wire**

been named Pittsburgh district manager for the company, and **Frank W. Morris,** manager of the Tulsa, Okla., district. Mr. Ramsburg had been manager of the Pittsburgh district since 1939, and during the war was also manager of the ordnance department sales. Mr. Conroy had been a member of the sales staff of the company's New York office during the last 6 years. Mr. Booth had been manager of the Tulsa district since 1942. He entered the metallurgical and research departments of Spang-Chalfant in 1929, later transferring to the sales department. Mr. Morris joined the sales department of Spang-Chalfant in 1925.

—o—

**David C. Crowley,** Houston, Tex., has been appointed representative in Texas for Colonial Broach Co., and Colonial Bushings Inc., both of Detroit.

—o—

**Astor L. Thurman** has been appointed assistant to the vice president, Aetna-Standard Engineering Co., Youngstown. **James Riddell** has been named chief electrical engineer for the company. Mr. Thurman came to Aetna-Standard as chief electrical engineer Dec. 1, 1945, after 8½ years with General Electric Co., Schenectady, N. Y. He is a member of the Association of Iron & Steel Engineers, Wire Association, American Society of Mechanical Engineers, and American Institute of Electrical Engineers. Mr. Riddell has been in the Aetna-Standard engineering department for the last 8 years, and recently had been assistant chief electrical engineer.

—o—

**H. Ward Lewis** has been appointed supervisor of operations, Pittsburgh Limestone Corp., Pittsburgh, a subsidiary of United States Steel Corp., New York. He has been with the company since 1920 as engineer, assistant superintendent and superintendent. **Clifton A. Pratt** has been named superintendent of the company's Kaylor Limestone Mine in Armstrong County, Pa., succeeding Mr. Lewis. Mr. Pratt originally joined Pittsburgh Limestone in 1939 as a plant mining engineer. He spent nearly 5 years in the Army.

—o—

**Robert L. White** has been elected a member of the board of directors of Marmon-Herrington Co., Indianapolis.

—o—

**George C. Newton** has been appointed Iron Mountain-Kingsford, Mich., community chairman of the Committee for Economic Development.

—o—

**Wilfred D. MacDonnell** has been named assistant to the general manager, Lackawanna, N. Y., plant, Bethlehem Steel Co., Bethlehem, Pa., succeeding **William J. McClung.** Mr. MacDonnell was assistant superintendent of the No. 1 open hearth department at Lackawanna.

—o—

**Simon Edinburg,** formerly with Harcon Corp., Boston, scrap dealers, has joined the Boston office of Luria Steel & Steel Trading Corp., New York.

—o—

**James E. Allen,** vice president, has been elected to the office of executive vice president, Aro Equipment Corp., Bryan, O.

—o—

**Edward C. Hamm** has been elected president, Service Caster & Truck Corp., Albion, Mich., which recently acquired the assets of Service Caster & Truck Division of Domestic Industries. Mr. Hamm had been sales manager of Service Caster & Truck Division since 1943.

—o—

**F. Faxon Ogden** has been appointed manager of special products sales development, and **J. J. McCarthy,** manager of chemical sales development in charge of new products for the paper and leather industries, Merrimac Division, Boston, Monsanto Chemical Co., St. Louis. Mr. Ogden had been manager of chemical sales development for the company. He spent two years in the Navy during the war. Mr. McCarthy, who joined Monsanto in 1922, had most recently been manager of textile sales development.

—o—

**Alexander B. Andrews Jr.,** Raleigh, N. C., has been appointed engineering representative in North and South Carolina for Kropp Forge Co., Chicago.

—o—

**Kenneth F. Thomas** has been appointed district engineer for the New England office of Kaydon Engineering Corp., Muskegon, Mich. For many years Mr. Thomas has been active in New England and the East as sales engineer for SKF Industries Inc., Philadelphia.

—o—

**John M. Davidson,** recently released from the Navy, has joined the sales staff, Special Chemicals Division, Pennsylvania Salt Mfg. Co., Philadelphia.

—o—

**Harold E. Jalass** has been appointed assistant general sales manager, Cribben & Sexton Co., Chicago. Mr. Jalass joined the company in 1917. In 1922 he joined the sales department, covering Chicago and supplementing other territories throughout the country. For the last 15 years he has been district manager for Universal Gas Ranges in the metropolitan Chicago area. He will continue in that capacity in addition to his new duties.

—o—

**R. J. Allen,** metallurgical engineer, Worthington Pump & Machinery Corp., East Harrison, N. J., has been appointed head of the 1946-47 program and papers committee, Gray Iron Division, American Foundrymen's Association, Chicago. **R. G. McElwee,** manager, Foundry Alloy Division, Detroit, Vanadium Corp. of

JAMES RIDDELL

ASTOR L. THURMAN

HAROLD E. JALASS

# IF YOUR PRODUCT IS LIKE ANY OF THESE

## . . Timken Alloy Steel Seamless Tubing May Lower Your Costs . . . .

If you make a hollow cylindrical part which could be machined from tubing ½" to 10½" O.D., you should talk to a member of the Timken metallurgical staff. Great opportunities for cost reduction and product improvement are open to manufacturers through use of Timken Alloy Steel Seamless Tubing.

No other seamless tubing producer offers such a wide variety of sizes and finishes in alloy, stainless and carbon steels. No other producer has such a wide technical background for making a job analysis of your tubular parts. Write Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

Adaptor Sleeves
Agricultural Implements
Air Compressors
Air Hammer Barrels
Air Pumps
Armature Shaft Sleeves
Automobile Tire Molds
Axle Housings
Axles of All Kinds

Ball Bearing Races
Ball Bearing Sleeves
Barrel Drills
Bicycle Frames
Bicycle Hubs
Bicycle Pumps
Boring Bars
Boring Bar Spindles
Bottle Washing Machines
Bronze Bearing Shells
Bushings

Camshafts
Casting Machine Bushings
Chain Bushings
Coaster Brakes
Collars
Core Barrels
Core Machine Dies
Cotton Picking Machinery
Cross Head Pins
Cross Steering Tubes
Crank Extension Sleeves
Cylinders, All Kinds
Cylinder Block Sleeves

Diamond Drill Rods
Differential Bearing Hubs
Drag Links (Automobile)
Drill Press Parts
Dust Collars

Elevator Plungers
Emery Wheel Dressers
Engine Lathes
Engine Parts
Exhaust Pipes

Feed Bars for Mining Machines
Fishing Rods
Fleece Rollers for Knitting Mills

Gear Blanks
Gravity Carriers
Grease Guns
Gun Barrel Drills
Gun Barrels
Golf Shafts

Hollow Shafts
Hydraulic Jack Tubes
Hydraulic Hoists (Auto Trucks)

Idler Roll Shafts

Knitting Machine Cylinders

Landing Gears (Aircraft)
Lathe Spindles
Laundry Machinery
Line Shaft Hangers

Mandrels
Mining Machinery
Motorcycles
Motor Cylinders
Moving Picture Apparatus

Nipples

Oil Burners

Piston Pins
Piston Rods
Pneumatic Carrier Tubes
Pneumatic Hammers
Pneumatic Tubes
Printing Press Rolls
Printing Presses
Propeller Blades (Aircraft)
Propeller Hub Parts (Aircraft)
Propeller Shafts
Pulley Sleeves
Pump Cylinders
Pump Jackets
Pump Liners
Pump Plungers
Push Rods (Automobile Engine)

Radius Rods
Refrigerating Machinery
Road Rollers
Roller Bearing Races
Rollers for Weaving Machines

Shaft Collars
Shells
Shock Absorbers (Automobile)
Shock Struts (Aircraft)
Shot Gun Magazines
Shrapnel Cases
Sleeves
Spacer Rings
Spinning Rings

Tool Joints
Tool Joint Sleeves
Torque Tubes
Trailer Axles
Track Bushings
Tricycles
Tubular Turnbuckles

Universal Joints (Automobile)
Upset Parts

Valve Seats
Ventilating Machinery

Wrist Pins

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
*Fine Alloy*
STEEL AND
SEAMLESS TUBES

★ YEARS AHEAD — THROUGH EXPERIENCE AND RESEARCH

**SPECIALISTS in hot rolled and cold finished Alloy Steel Bars for forging and machining applications, as well as a complete range of Stainless, Graphitic and Standard Tool Steel analyses. Also Alloy and Stainless Seamless Steel Tubing for mechanical and pressure tube applications.**

America, Detroit, has been named vice chairman of the committee, and **T. D. Parker,** metallurgical engineer, Climax Molybdenum Co., New York, has been named secretary.

—o—

**Richard F. Muller** has been named manager of the New Orleans district office, Allis-Chalmers Mfg. Co., Milwaukee, succeeding **F. W. Stevens,** who after 41 years of service, has requested to be released from this responsibility. Mr. Muller joined the company in 1920, and was promoted to assistant manager of the New Orleans district office early this year. He is a member of American Society of Mechanical Engineers. Mr. Stevens, who continues with the company as a special representative in the New Orleans office, joined Allis-Chalmers in 1905 as a correspondent in the Atlanta office. He had been district manager at New Orleans since 1912.

—o—

**William V. Pyndus** has been placed in charge of the new Syracuse, N. Y., office, open Sept. 1, of Penflex Sales Co. Division, Pennsylvania Flexible Metallic Tubing Co., Philadelphia. The territory served by Mr. Pyndus was formerly covered by four other branch offices, and will include such cities as Binghamton, Buffalo, Elmira, Jamestown, Niagara Falls, Rochester, Rome, Schenectady and Utica, all in New York. Mr. Pyndus has been at the company plant in Philadelphia and at the New York office during the last month.

—o—

**J. Donald Zaiser** has been elected president, Ampco Metal Inc., Milwaukee, succeeding his father, the late **C. J. Zaiser.** Mr. Zaiser, who had been executive vice president since March, 1944, also will be general manager of the firm. He joined Ampco in 1933 in the production department. He transferred to the field sales department in 1934, and became department manager in 1936. He became general sales manager in 1938, and vice president and assistant general manager in 1940. In March, 1944, he became executive vice president, and was given the added duties of general manager in March, 1945.

—o—

**F. L. Steuber** has been appointed assistant general manager of sales, Central Iron & Steel Co., Harrisburg, Pa. Prior to joining the Central organization as Philadelphia district sales manager in Sept., 1945, Mr. Steuber had been with Heat Transfer Products Inc., New York. Before that, he had been in Philadelphia for many years with Carnegie-Illinois Steel Corp., Pittsburgh, a subsidiary of United States Steel Corp.

—o—

**John A. Sargent,** recently released from the Army, has been elected treasurer, Diamond Alkali Co., Pittsburgh. He had been vice president and general sales manager of Truscon Steel Co., Cleveland, a subsidiary of Republic Steel Corp., Cleveland.

—o—

**J. M. Reynolds** has been appointed executive assistant, Birmingham Electric & Mfg. Co., Birmingham. **L. E. Sostner** has been named auditor of the company, succeeding Mr. Reynolds.

—o—

**Frank J. Hughes** has been appointed sales manager, Heating & Air Conditioning Division, Gar Wood Industries Inc., Detroit.

—o—

**Moorhead Wright Jr.** has been appointed to the staff of L. R. Boulware, vice president, General Electric Co., Schenectady, N. Y. Mr. Wright will assume new duties in the executive department of the company in New York, Sept. 3. He will be succeeded as manager of the apparatus department's employee information division in Schenectady by **D. J. Sullivan.** Mr. Wright joined General Electric in 1927, and had held his previous position with the company since last year. Mr. Sullivan joined G. E. in 1934, and has been associated with the employee information division since his release from the Army last November.

—o—

**Horace B. McCoy** has been appointed director, Office of Domestic Commerce, Department of Commerce. He had been serving as acting director of the office since May 1, when **Gen. Albert J. Browning** resigned to become director of purchases for Ford Motor Co., Dearborn, Mich.

—o—

**Robert F. Thomas** has been appointed vice president, Hardy Mfg. Corp., Pendleton, Ind., makers of radiator shutters and metal stampings. Mr. Thomas has been in charge of operations since 1940. **A. A. Pfaff** has been advanced to the position of treasurer.

—o—

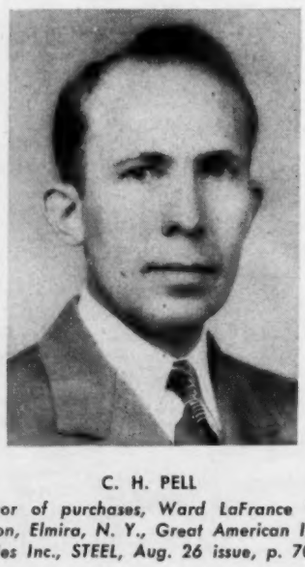
**R. E. Lynch** has been named manager of the newly organized transmission engineering department, Allison Division, General Motors Corp., Detroit. **J. E. Storer** will be chief ordnance engineer, and **R. M. Shaefer,** chief commercial engineer on transmission projects.

—o—

**William J. Reagan** has been appointed associate professor of metallurgy, Pennsylvania State College, State College, Pa. He will specialize in the extractive metallurgy and primary processing of iron and steel. In addition to teaching, he will do consulting work and will also have charge of an experimental steelmaking

**W. H. MARSH**

*General manager of the new Hydraulics Division, Rockwell Mfg. Co., Pittsburgh, noted in STEEL, Aug. 26 issue, p. 68.*



**C. H. PELL**

*Director of purchases, Ward LaFrance Truck Division, Elmira, N. Y., Great American Industries Inc., STEEL, Aug. 26 issue, p. 70.*

**WILLIAM J. McCLUNG**

*Who has been named general manager, Bethlehem Pacific Coast Steel Corp., noted in STEEL, Aug. 19 issue, p. 95.*

RALPH R. NEWQUIST

*Vice president in charge of sales, Roots-Connersville Blower Corp., Connersville, Ind., noted in STEEL, Aug. 26 issue, p. 70.*

A. D. ANDRIOLA

*Appointed chief research engineer, De Laval Steam Turbine Co., Trenton, N. J., noted in STEEL, Aug. 26 issue, p. 68.*

W. C. STEVENS

*Who has organized his own company, Stevens Mfg. Co., Mansfield, O., noted in STEEL, Aug. 26 issue, p. 66.*

program. Professor Reagan had been research metallurgist with the Warren, O., Division of Copperweld Steel Co., Glassport, Pa. Prior to that, he was assistant superintendent of open hearths at Edgewater Steel Co., Oakmont, Pa.

—o—

**R. A. Williamson** has been appointed manager, Railroad Rolling Stock Division, Transportation Divisions, apparatus department, General Electric Co., Schenectady, N. Y., succeeding **T. F. Perkinson** who has been transferred to the Transportation Engineering Division. Mr. Williamson will be responsible for the sale, application and servicing for all company railroad rolling stock business. He joined General Electric in 1927, at the Erie, Pa., works. He had been marine engineer for the company's New York district since 1944.

—o—

**D. A. Nabb** has been appointed assistant sales manager, Detroit Seamless Steel Tubes Co., Detroit. He has been with the company, in the sales department, since November, 1945.

—o—

**Theodore A. Smith** has been promoted to the post of general sales manager, engineering products department, Radio Corp. of America, New York.

—o—

**Leonard T. Beale,** president of Pennsylvania Salt Mfg. Co., Philadelphia, and **Richard T. Davies,** assistant to the president of Pennsalt, have received the King Christian X Medal of Liberation from King Christian X of Denmark.

—o—

**Brig. Gen. William W. Welsh,** former assistant chief of air staff, Army Air Forces, has been appointed technical advisor to the general manager, Aircraft Division, Fairchild Engine & Airplane Corp., New York.

—o—

**William R. Thompson,** Washington, Pa., has been appointed district manager for western Pennsylvania, Geary Stainless Steel Co., Baltimore. **Edward G. Cressell,** Chicago, has been named district manager for Illinois, Indiana, and southwestern Michigan territory.

## OBITUARIES....

**Charles H. McCrea,** 56, for the last 4 years president, National Malleable & Steel Castings Co., Cleveland, died after completing a round of golf at the Pepper Pike Country Club near that city, Aug. 24. He had been with the company since 1913. He was a director of Interlake Iron Corp., Cleveland, and Railway Business Association. Mr. McCrea was a former trustee of Malleable Founders' Society and a member of Steel Founders' Society of America.

—o—

**Carl D. Bushnell,** 65, founder and president of Bushnell Machinery Co., Pittsburgh, died Aug. 24.

—o—

**Frank J. Seng,** 77, since 1900 president of Seng Co., Chicago, died Aug. 18 in that city.

—o—

**Henry De Huff,** partner in the firm of De Huff & Hopkins, Philadelphia, manufacturers' representatives, died Aug. 22. For more than 25 years, he represented Easton Car & Construction Co., Easton, Pa., in the Philadelphia area as sales engineer for industrial material handling equipment.

—o—

**Gerald Thorp,** 53, vice president, Bethlehem Foundry & Machine Co., Bethlehem, Pa., died in that city, Aug. 23. He joined the company in 1935.

—o—

**Albert Sears Crane,** 78, who retired ten years ago as vice president of J. G. White Engineering Corp., New York, died in Bar Harbor, Me., Aug. 25. He specialized in hydraulic engineering, and was a director of the White Company at the time of his death.

—o—

**William Martin Wampler,** 79, manufacturer of railroad equipment, died recently in New York. He was president and a director of National Brake Co., and Ellcon Co., both of New York.

—o—

**Col. Sir Thomas Andrew Polson,** 81, British industrialist, died in London, Aug. 22. He was chairman of Butlins Ltd., Duffield Iron Corp. Ltd, James Walker, Goldsmith & Silversmith Ltd., and Rolls Razor Ltd.

—o—

**Charles J. Pilliod,** 84, who retired 2 years ago as president, Standard Locomotive Equipment Co., Toledo, O., died recently.

—o—

**Jacob Fischer,** 79, who retired 15 years ago as president, David Architectural Iron Works, Chicago, a company which he founded in 1925, died Aug. 22 in that city.

—o—

**Edward P. Welles,** 76, chairman, Charles H. Besly & Co., Chicago, died in that city, Aug. 24. He joined the company as an office boy at the age of 16, became general manager in 1898, president in 1909, and chairman of the board in 1942.

—o—

**Paul Shuman,** 62, treasurer and member of the board of directors, Atlantic Refining Co., Philadelphia, died at his home in Malvern, Pa., Aug. 22.

# Economic Aspects of TUBE BENDING

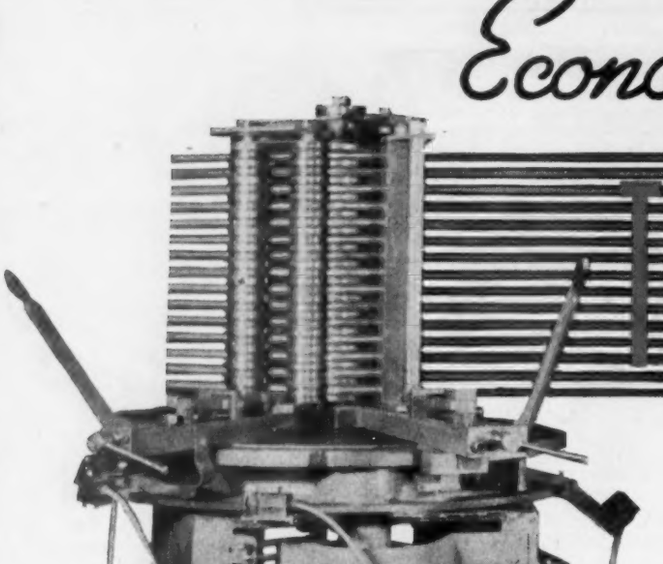


*Fig. 1—Multiple die bender for tubular furniture capable of bending fifteen 1-in. tubes at one time, thus lowering unit costs*

**In fabricating tubular parts, closer study may very well be given to machine production as this is the one factor in costs which may be more closely controlled**

By RALPH SHAW JR.
*President*
Pedrick Tool & Machine Co.
Philadelphia

BENDING machines, like all other machines, are bought for economic reasons. The question is not so much "how is it made" but "what will it do." For this reason, it is customary to build modern machines for as high production as is feasible, which means low cost for the piece produced. It should be pointed out that the cost of the piece produced is a function of labor, overhead material and machine cost. Over material and labor, the machine builder has little control. Consequently the production of his machine carries more weight than any other item in computing the final cost.

Amortization, interest on investment and maintainance, reduced to an hourly cost, constitute machine cost. To this is added labor and overhead. This is on an hourly basis. Dividing by the production per hour gives the cost for fabricating each piece. Addition of the material provides the cost per piece. Since production generally varies as first cost, the accompanying table is illustrative of this thought.

The reason for the above is because *genus homo sapiens* is long on brains but short on horsepower. Some employers are prone to buy man-made horsepower which is very expensive. A strong man, worth $1 per hour, can generate ⅛ hp, so manpower costs $8 per horsepower-hour during an 8-hour day. You can buy all the electric power you want for 2 cents per horsepower-hour consequently manpower is very expensive, to say the least, and not very satisfactory.

To obtain maximum production it is necessary to do the following things: (1) Make the machine do everything but think; (2) make the machine do as many things simultaneously as possible; (3) use multiple production; and (4) design your product for manufacturing as well as artistic reasons.

Consider the tubular furniture business. There are many kinds of articles to be made—for one, the chair with arms—known as the S chair, because of its shape. The S chair usually has six vertical and two horizontal bends, but sometimes has four of the latter. The horizontal bends are used as a base on the floor. It is generally made of 1 in. tubing.

The six vertical bends may be made on a production bender 10 at a time. Two passes may be made per minute for power benders and five for automatics. Let us only consider the power benders. Two passes of 10 each gives 20 bends per minute or 3 1/3 chairs per minute. But it is necessary to apply the horizontal bend which are out of plane and therefore must be applied one at a time. This requires 2 min for two bends, or 2 min per chair. The total time required to bend one chair is therefore 2 1/3 min, which means a production of about 25 chairs per hour. If, however, horizontal bends are made in a separate piece and welded, brazed or shrunk on after bending, all of the bends may be made in multiples of 10, giving a production of 2 1/2 chairs per minute or 150 chairs per hour.

In the first case, the chairs are costing 13.6 cents plus material; in the last, they cost 2.2 cents plus material, plus welding or putting together the three parts. This is known as "designing for manufacture".

The production machines required to handle tubular furniture are composed of four parts:

(1) The loading mechanism; (2) the feeding mechanism; (3) the bending device; and (4) the ejector.

Such a machine will take tubing off a conveyor, load, feed, and bend it, and eject the finished parts without any manual attention whatever. This is a truly auto-

matic machine. Usually these machines handle from 5 to 10 pieces in multiples so long as all the bends are in the same plane. With automatic feeds and loading, three or four passes as an average can be obtained per minute, and if 10 pieces are being bent in multiples at four passes per minute, production can be 40 bends per minute or 2400 bends per hour. This is a theoretical figure and such a machine would be classed as a "1000-piece bender".

Few people realize that speed of the machine is dependent on handling and not on bending. A machine may make a bend in 1 sec, but if it takes 5 min to load it and decide where to make a bend, the production will be a little less than 12 bends per hour. For this reason, many machines are bought without loading, feeding or ejctor devices with the result that the operator must do this work. Such a machine becomes a simple production bender and requires more operator attention. Production speeds range up to 1000 bends per hour so that these machines are classed as "500-piece benders", as it is customary to under-rate production by as much as 50 per cent for a factor of safety.

There are four standard methods of bending tubing, namely, compression, drawing, rolling and ram processes. The first two are called "rotary head" processes and are the usual processes for tubular furniture bending. In the compression process, the die or central roll is stationary and the piece is wiped into it. In this case, the piece is stationary and is not usually clamped. No internal support is generally employed although a "snake" or flexible mandrel is sometimes used, though not in the furniture trade. When used, the snake is mounted on the bending fixture and recedes with it. When a snake must be used, it is usually not desirable to bend furniture in compression, although not impossible.

The drawing process comprises the use of a rotating die or roll to which the piece being bent is clamped. Since the flattening of such a process is severe, internal support is usually employed and the piece being bent is drawn over it, hence the name. Such a bend can be to a very close radius without wrinkling and very thin tubing may be used if desired, limit being obtained by degree of draw in the periphery of the bend. Due to the presence of the mandrel, the draw machine is much more complicated, but high production can be insured if necessary. The first cost is usually about 50 per cent higher, and the weight is about double but horsepower required is considerably less.

Main difference between the compression and the draw processes lies in the position of the neutral axis. In the former, this axis is in the outer third of the section; in the later, it is in the inner third. This means that for the former, about two-thirds of the piece is in compression while for the latter, two-thirds is in tension. For this reason, chromium plated tubing can be bent in a compression machine without stripping off the plating so long as the radius is not too close. The same is true of enameled tubing. Structural shapes may be handled in either machine as well as aluminum or stainless steel.

Quality of bend is often determined by what is being bent. The furniture trade (*Please turn to Page* 144)

AMORTIZATION OF TUBE BENDING EQUIPMENT

| | Hand Bender | Power Bender | Automatic |
|---|---|---|---|
| First Cost | $1500 | $3000 | $10,000 |
| 5 yr. Amortization (per year) | 300 | 600 | 2,000 |
| Interest—4% | 60 | 120 | 400 |
| Maintenance | 40 | 80 | 600 |
| Total Cost per yr. | 400 | 800 | 3,000 |
| Cost per hr. | 0.20 | 0.40 | 1.50 |
| Direct Labor | 1.00 | 1.00 | ... |
| Overhead | 2.00 | 2.00 | 2.00 |
| Total Cost per hr. | 3.20 | 3.40 | 3.50 |
| Production per hr. | 150 | 300 | 1,000 |
| Cost per piece | 0.0213 | 0.014 | 0.0035 |

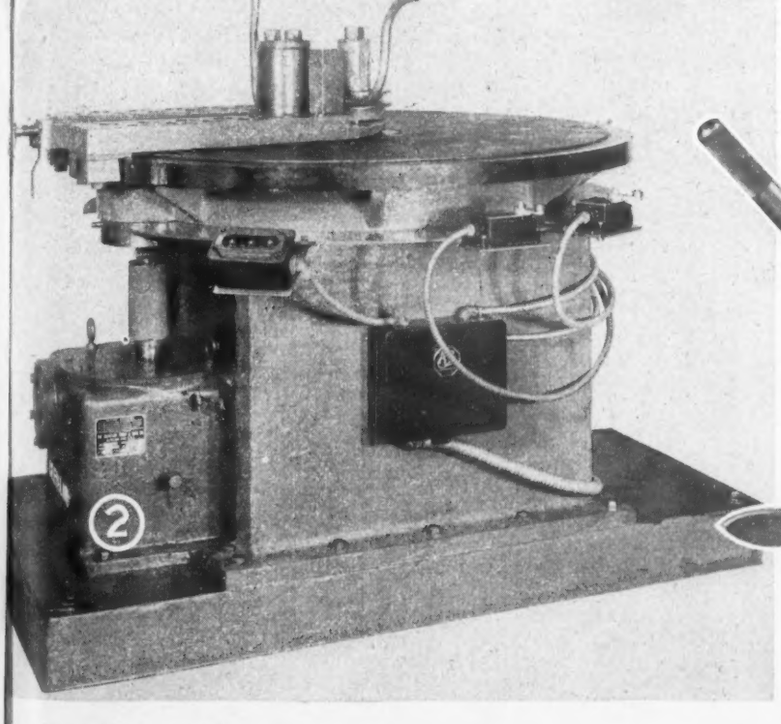



*Fig. 2—Simple power bender for tubular furniture. Machine is for either right or left-hand bending. Use is unsound economically for production jobs as the output is relatively low*

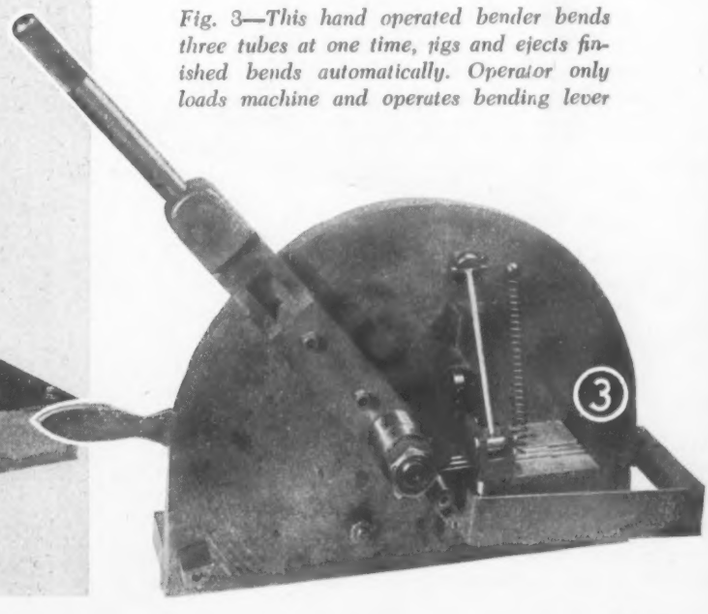



*Fig. 3—This hand operated bender bends three tubes at one time, jigs and ejects finished bends automatically. Operator only loads machine and operates bending lever*

# Drying Stopper Rods

INSTALLATION of a new type of recirculating convection oven at the Scullin Steel Co., St. Louis, eliminated many of the uncertainties in drying and handling of stopper rods. Formerly the rods, used in steel mill ladles, were dried by means of blow torches or small wood fires. This method of drying was spotty, and the rods were not always ready when required. Improper drying often caused splattering of metal—a definite hazard to the safety of the worker nearby.

With this new rod drying oven, designed and built by Despatch Oven Co. of Minneapolis, rods are loaded individually on trolleys in a vertical position. The trolleys, through a switching arrangement, load the rods in the oven on three tracks which run the length of the oven, each entering through a separate door. An exterior view of the oven, the overhead trolley and switching arrangement, and a rod ready to move into the oven are shown in Fig. 1.

Fig. 2 shows the interior of the oven with the stopper rods in position. At the unloading end of the oven there are also three doors—one for each line of track, facilitating the removal of a rod quickly and with a minimum loss of heat in the oven. As shown in Fig. 2, tracks run alongside of oven from unloading end, curving around to loading end. This arrrangement minimizes rod handling during loading and unloading of trolleys.

Stopper rods are pushed through the oven manually. After one rod is removed, another is put in at other end to replace it. Rods are always available when required, and are constantly at the correct temperature. Quicker and more thorough processing is claimed for this method of drying.

Interior working dimensions are 6 ft wide, 20 ft long and 10 ft 6 in. high. Capacity of the oven is 69 rods at one time, and with approximately 20 rods being used each day, each rod has a drying time of two or more days at an average operating temperature of 350° F.

A direct fired, externally mounted heater, also made by Despatch, furnishes the oven with 250,000 Btu's per hour. Heater is capable of heating oven to a temperature of 425° F if required. Temperature and safety controls are entirely automatic.

Heated air is introduced into the oven through duct work at the bottom of the work chamber with recirculating duct at top. Separate vent removes moisture-laden air to outside.

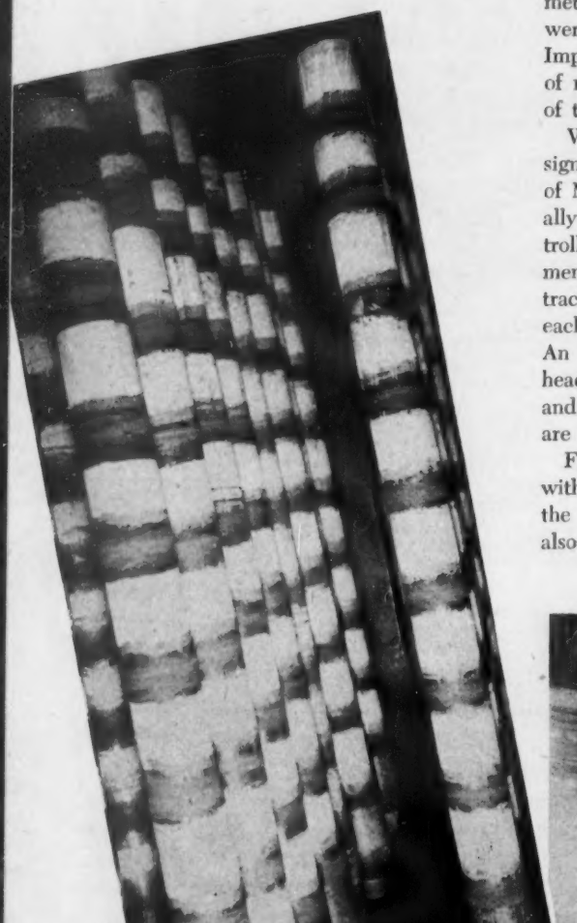


*Fig. 1 (right)—Stopper rod on individual trolley ready to be loaded into oven shown in background. Rods are loaded through one of three doors, each with its own overhead track connected to loading section by a switching arrangement shown at left end of oven here*

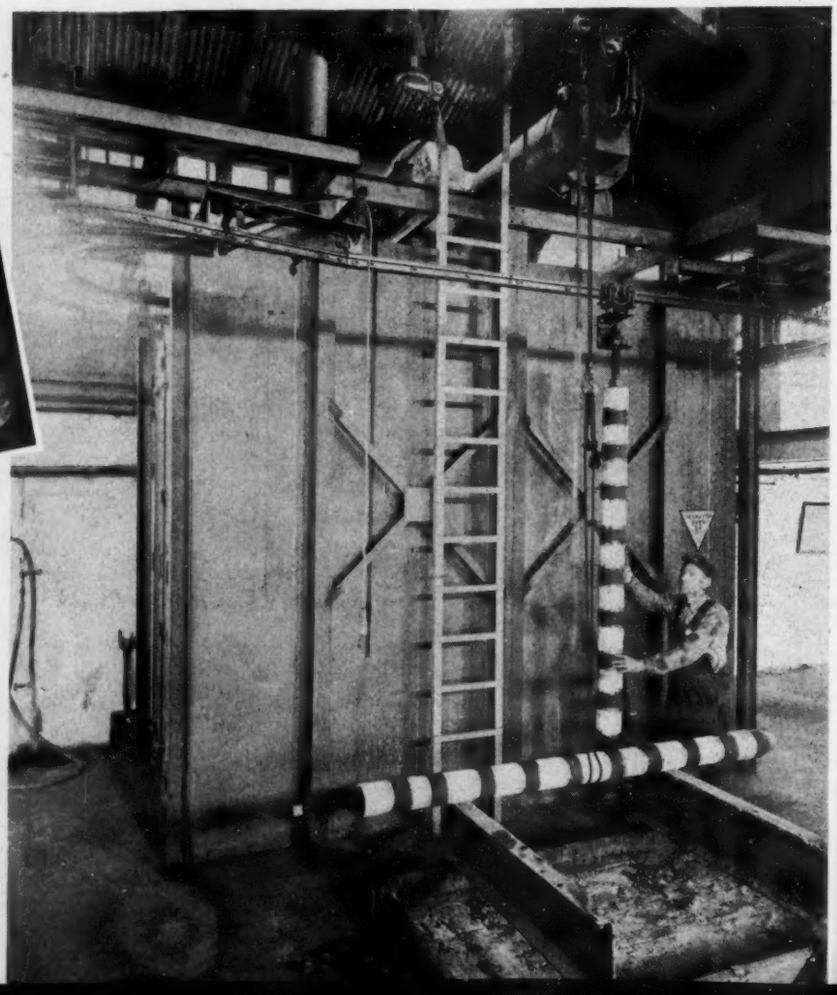


*Fig. 2 (above)—Interior view of recirculating convection oven showing stopper rods in place for drying on their respective tracks*

# ENGINEERING NEWS *at a glance*

MECHANIZATION of two cast iron radiation plants, due for completion in August, will increase national production of cast iron radiation by approximately 30,000 sq ft per month, according to the Civilian Production Administration. Monthly rate of cast iron radiation production in May, June and July for the nation exceeded 3 million square feet, more than double the average monthly rate in the last half of 1945.

DUE to appear on the market sometime this fall is a new oil, grease and water absorbent which, used on plant floors, eliminates danger of accidents caused by slipping and minimizes chances of flash fires. Developed by Blue Mountain Clay Co. Inc. of Memphis, Tenn., the product is made from an alumina silicate material, and is capable of absorbing from 120 to 140 per cent of its own weight. The granular absorbent is free of dust and nonabrasives; it also can be "tailor-made" to meet the user's requirements without sacrificing its absorptive qualities.

FROM Chicago, Joseph T. Ryerson & Son Inc., advises that the Hi-Bond reinforcing bars, introduced a couple of years ago for use as concrete reinforcing steel, recently was found ideally suited for foundry gagger bar applications. Special design of the bars which consists of double reverse helical ribs between horizontal ribs provides maximum mechanical grip as well as great bonding surface for a given section of gagger bar. In addition, sand may be packed more firmly and evenly around each gagger, holding the mold together more securely.

NEWS that hot-air engines of 3000 rpm and higher were built experimentally in the Philips Research Laboratories at Eindhoven, Holland, during the war is revealed in one of the latest issues of "Philips Technical Review", received recently in Irvington, N. Y., by the affiliate organization. This is said to be the first major improvement in this type of engine in over a century. The publication discloses that as a result of new principles developed, a refrigerator of high efficiency already has been proved experimentally in Holland. The article, which discusses principles of the hot-air process and the hot-air engine, is the first of a series to be published in successive issues of the Review.

NOT just a tube of metal, the tailpipe incorporated in the P-80A jet plane is engineered to sustain heat, friction and pressure of a roaring blast escaping through it at temperatures up to 1700° F. Several parts are used to assemble the tailpipe. One consists of a stainless steel cylinder 96 in. long, 21 in. in diameter on the large end, and 19 in. on the small end—the inner tube. Another part is an aluminum cylinder 94 in. long, 22 in. in diameter on the large end and 20 in. on the small end. Third part consists of stainless steel screening plus aluminum foil as insulating material between the two cylinders. In joining these parts, Solar Aircraft uses a roll-welder designed by Thomson Electric Welder Co. of Lynn, Mass., to resistance weld about 1500 in. of welding required. An outside lap seam is used to seam weld the inner tube because its bore must be as smooth as possible.

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IN the Aug. 19 issue of STEEL, it was reported in these columns that the Plasteel Corp., Detroit, has sold its manufacturing rights on a wax-type drawing compound (covered in a feature article in STEEL Feb. 11, 1946, beginning on page 88) and now is concentrating on the production of plastic novelties.

"Nothing could be further from the truth!" writes Dr. A. L. Bunting, president. "We have not disposed of our wax-type drawing compound nor are we in the plastic novelty business. We are essentially a chemical engineering corporation specializing in research and product development."

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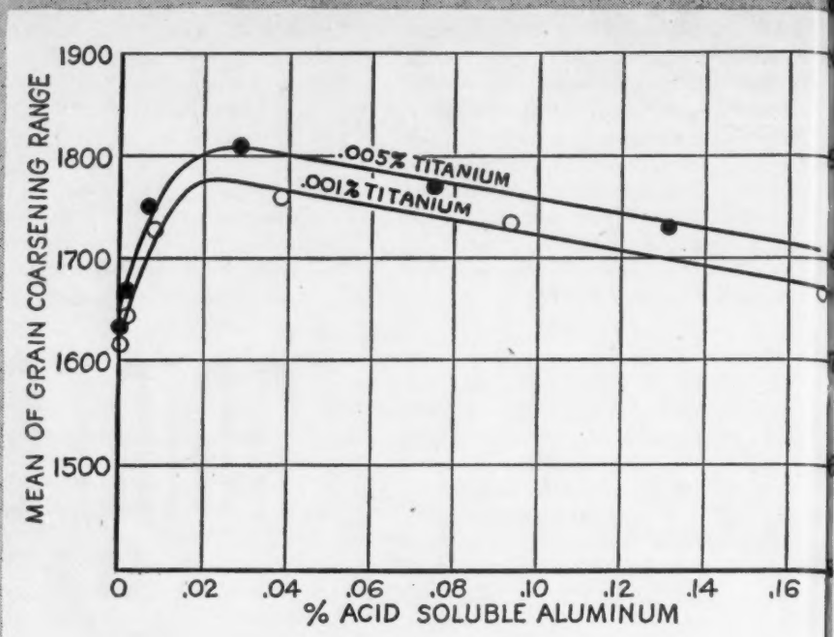
ENGINEERS at the Aircraft Engine Research lab at Cleveland airport are using photography at the rate of 200,000 frames per second to catch "knocks" in the operation of aircraft engines. The ultra high-speed camera, designed specifically for this purpose by C. D. Miller, a mechanical engineer, takes 10 photographs in the space of fifty-millionths of a second. Referred to as an optical compensatory type, it stops motion of an object traveling 4760 miles per hour. In gasoline and diesel engines, the detonation waves travel at speeds as great as 7000 fps. These waves are stopped by the camera at close intervals. National Advisory Committee for Aeronautics officials say the instrument can be used to study airflow around supercharger and compressor blades where the speed may reach 20,000 rpm.

MODERN geological study, by demonstrating the presence of oil along seacoasts, has focused the attention of the petroleum industry on underwater drilling, particularly in the oceans along the continental shelf. Thus ocean drilling is increasing, especially along the Gulf coast, and more and more of this type of drilling is expected. So far, the American Petroleum Institute reports, drilling has not been attempted in more than 60 ft of water. Petroleum engineers, however, now are studying methods that will permit drilling operations at much greater depths.

AMONG nonferrous metals imported into Brazil during 1945 were 13,767 metric tons of lead, 379 tons of tin, 20,838 tons of copper and alloys, 2206 tons of zinc, 3663 tons of aluminum and 66 tons of antimony, according to the Bureau of Foreign and Domestic Commerce, Washington. All the antimony and approximately all the tin in ingots, bars and the like came from the United States. This country also supplied 82 per cent of the lead, 44 per cent of the zinc, 41 per cent of the copper and alloys and 36 per cent of the aluminum.

THOSE seeking a source for electrical contact springs of beryllium copper may do well to note the name of Gibson Electric Co. of Pittsburgh, in their little memo books. The company reports it recently increased its controlled atmosphere heat treating facilities to meet the increased demand for contact springs of this material. It also is manufacturing complete contact assemblies on which electrical contacts of silver, silver alloys or powdered metal compositions are attached to contact supports of various metals.

# Effects of grain growth inhibitors in Fine-Grained Steels




By JAMES W. HALLEY
*Metallurgist*
Inland Steel Co.
East Chicago, Ind.

DESPITE the fact that fine grained steels have been standard products for many years, quantitative data concerning how much a certain amount of aluminum, titanium, or zirconium raised the coarsening temperature and affected the properties, all other factors being constant, are very meager. An investigation was conducted to determine the effect of individual elements on grain coarsening by adding ¼, ½, 1, 2 and 4 lb grain-growth inhibitors per ton to a series of ingots of an open-hearth heat. Results of the investigation were reported in a paper presented before the Chicago meeting of the American Institute of Mining and Metallurgical Engineers.*

Samples were taken from the middle cut of each ingot and forged to 1-in. rounds, which were used for grain coarsening and physical tests. Steels used for the series were of approximately 0.30 per cent carbon, 0.80 per cent manganese and 0.25 per cent silicon and all samples were normalized from 1600° F prior to grain-coarsening or physical testing.

As shown in Fig. 2, (wherein the mean of the grain-coarsening temperature after 4 hour heating is plotted against element content) maximum coarsening temperature lies in the neighborhood of 0.028 per cent acid-soluble aluminum. Additions in excess of 0.028 not only lower the coarsening temperatures but also widen the coarsening range.

A slight increase in tensile strength and decrease in reduction of area (Table I) was noted with increasing aluminum content. Notched impact resistance (Table II) was also improved, temperature at which brittle failure appears is reduced and the amount of energy absorbed at room temperature is increased. This is not completely a grain-refining effect because the largest aluminum addition reduces the temperature at which coarsening started to below the normalizing temperature of 1600° F but does not raise the temperature of brittle failure.

Effects of titanium additions were studied by adding metallic titanium to a series of ingots from two heats. It was found that titanium increases the coarsening temperature continuously up to 0.17 per cent titanium. Small titanium additions did not cause as great an increase in coarsening temperature as similar aluminum additions, but since large aluminum (*Please turn to Page* 124)

*James W. Halley, "Grain-growth Inhibitors in Steel."

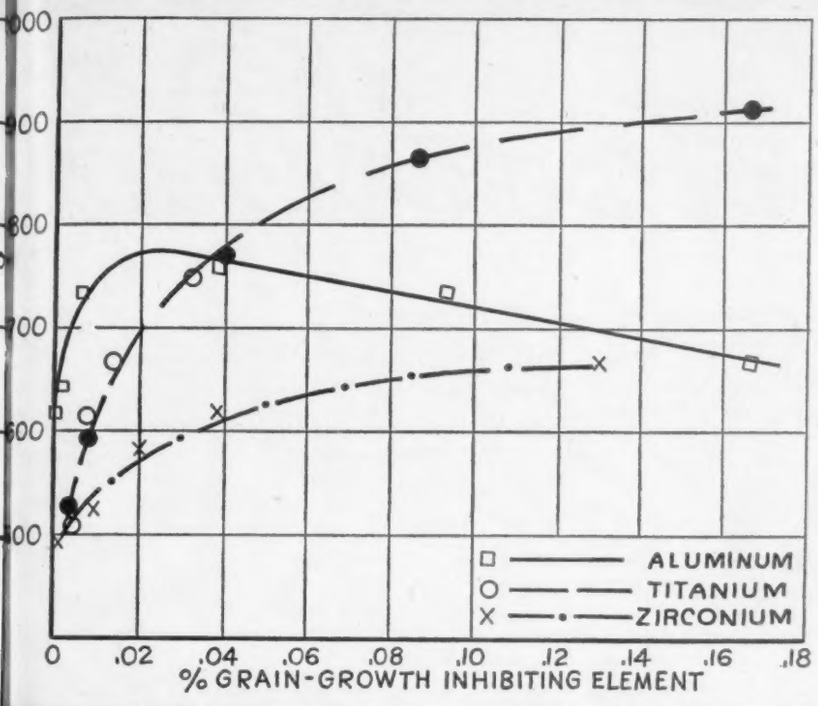



*Fig. 1 (left)—Effect of aluminum with varying titanium on coarsening temperature*

*Fig. 2 (right)—Effect of common grain-growth inhibiting elements on coarsening temperature*

TABLE I

TENSILE PROPERTIES OF ALUMINUM SERIES

| Acid Soluble Aluminum, % | Yield Point, psi | Tensile Strength, psi | Elongation in 2 in., % | Reduction of Area, % |
|---|---|---|---|---|
| 0 | 52,000 | 76,000 | 32.5 | 60.0 |
| 0.001 | 51,000 | 76,000 | 31.2 | 47.5 |
| 0.009 | 51,000 | 77,000 | 31.0 | 52.5 |
| 0.038 | 52,000 | 76,000 | 32.5 | 58.0 |
| 0.073 | 55,000 | 78,000 | 30.0 | 53.6 |
| 0.169 | 55,000 | 79,000 | 31.0 | 53.6 |

TABLE II

NOTCHED IMPACT RESISTANCE OF ALUMINUM SERIES

| Acid-soluble Aluminum, % | Charpy Impact, Foot-pounds 75° F | 0° F | —25° F | —50 F | —75° F | —100° F |
|---|---|---|---|---|---|---|
| 0 | 35.0-36.0 | 22.5-22.5 | 18.0-18.0 | 16.0- 3.5 | 3.0- 2.0 | 2.0- 2.0 |
| 0.001 | 37.0-35.0 | 26.5-25.0 | 24.5-21.0 | 20.0-20.0 | 15.0- 2.5 | 6.0- 2.0 |
| 0.009 | 30.0-28.0 | 30.0-30.0 | 28.0-28.5 | 28.5-25.5 | 20.5-19.5 | 17.5- 3.0 |
| 0.038 | 41.0-40.0 | 35.5-33.5 | 28.5-28.0 | 25.0-21.5 | 21.0-20.0 | 19.0-17.0 |
| 0.073 | 37.0-39.0 | 29.0-30.0 | 20.5-24.0 | 22.0-26.5 | 23.0-20.0 | 22.0-20.0 |
| 0.169 | 37.0-35.0 | 30.0-32.0 | 29.0-27.5 | 25.0-25.5 | 26.0-24.5 | 21.0-17.0 |

TABLE III

TENSILE PROPERTIES OF TITANIUM SERIES

| Titanum Content, % | Yield Point, psi | Tensile Strength, psi | Elongation in 2 in., % | Reduction of Area % |
|---|---|---|---|---|
| 0.003 | 50,000 | 81,000 | 31.8 | 56.2 |
| 0.008 | 52,000 | 81,000 | 32.2 | 58.9 |
| 0.016 | 52,000 | 81,000 | 31.8 | 51.8 |
| 0.033 | 56,000 | 84,000 | 29.5 | 50.1 |
| 0.003 | 42,000 | 77,000 | 32.2 | 59.2 |
| 0.008 | 48,000 | 77,000 | 32.2 | 59.8 |
| 0.040 | 51,000 | 77,000 | 32.8 | 58.6 |
| 0.085 | 56,000 | 80,000 | 32.5 | 60.3 |
| 0.170 | 55,000 | 80,000 | 31.2 | 60.4 |

TABLE IV

NOTCHED IMPACT RESISTANCE OF TITANIUM SERIES

| Titanium Content, % | Charpy Impact, Foot-pounds 75° F | 0° F | —25° F | —50° F | —75° F | —100° F |
|---|---|---|---|---|---|---|
| 0.003 | 29.0-26.0 | 21.0-19.5 | 18.5-14.5 | 3.0- 2.5 | 2.5- 2.0 | 2.0- 2.0 |
| 0.008 | 32.0-30.0 | 25.0-17.5 | 21.0-15.5 | 3.0- 3.0 | 7.0- 2.5 | 2.0- 2.0 |
| 0.016 | 28.0-27.5 | 24.0-19.5 | 20.0-19.0 | 18.0-17.0 | 17.0-15.5 | 6.0- 3.0 |
| 0.033 | 30.0-27.5 | 25.0-21.5 | 21.0-19.5 | 17.5-16.0 | 17.0-16.0 | 15.0- 4.0 |
| 0.003 | 36.5-34.0 | 27.0-24.5 | 21.0-12.0 | 18.0- 3.5 | 7.5- 3.0 | 4.5- 2.5 |
| 0.008 | 36.0-34.0 | 25.5-25.0 | 18.5- 4.0 | 21.5-19.0 | 2.5- 2.5 | 3.5- 2.5 |
| 0.040 | 42.0-39.5 | 28.5-28.5 | 23.0-22.5 | 25.0-23.0 | 21.5-19.0 | 12.0- 7.0 |
| 0.085 | 41.5-40.5 | 28.0-25.5 | 23.5-23.5 | 24.0-20.5 | 20.0-19.0 | 12.5- 3.0 |
| 0.170 | 37.0-36.0 | 35.0-24.0 | 23.0-23.0 | 22.5- . . . | 19.5-17.5 | 4.0- 2.5 |

TABLE V

TENSILE PROPERTIES OF ZIRCONIUM SERIES

| Zirconium Content, % | Yield Point, psi | Tensile Strength, psi | Elongation in 2 in., % | Reduction of Area, % |
|---|---|---|---|---|
| None | 46,500 | 77,000 | 32.5 | 62.0 |
| 0.009 | 47,000 | 76,000 | 31.2 | 61.3 |
| 0.021 | 47,000 | 77,000 | 32.2 | 61.4 |
| 0.038 | 48,000 | 76,000 | 30.0 | 59.1 |
| 0.134 | 48,000 | 75,500 | 32.0 | 58.7 |

TABLE VI

NOTCHED IMPACT RESISTANCE OF ZIRCONIUM SERIES

| Zirconium Content, % | Charpy Impact, Foot-pounds 75° F | 0° F | —25° F | —50° F | —75° F | —100° F |
|---|---|---|---|---|---|---|
| None | 40.0-36.5 | 28.0-24.0 | 24.5-15.0 | 3.0- 3.0 | 2.5- 2.5 | 2.5- 2.0 |
| 0.009 | 36.5-37.0 | 33.5-31.0 | 31.5-28.0 | 25.0-16.5 | 3.0- 3.0 | 2.0- 2.0 |
| 0.021 | 44.5-44.0 | 35.0-29.5 | 30.5-29.0 | 25.0-23.0 | 21.5-21.0 | 17.5- 2.5 |
| 0.038 | 45.5-40.0 | 35.0-31.5 | 30.0-28.0 | 24.0-22.5 | 23.5-23.0 | 22.0- 3.5 |
| 0.134 | 41.5-38.0 | 34.0-32.5 | 27.0-26.5 | 27.0-24.0 | 21.0-20.5 | 17.0- 8.0 |

# Controlling

*Fig. 1—Air view of the battleship, USS California undergoing repairs in one of the Navy's largest steel floating type drydocks*

*Fig. 2—View of port side keel and bilge blocks used to support vessels in a floating drydock*

*Fig. 3—A is chart of general plan of a pontoon deck for 6000-ton steel floating drydock. B is chart showing deviations in the pontoon deck*

*Fig. 4—Ends being fitted to center section of steel floating drydock while secured to outfitting pier*

# Distortion

By WILLIAM F. DAWSON
*Head Welding Practice Subsection*
Navy Bureau of Yards and Docks
Washington

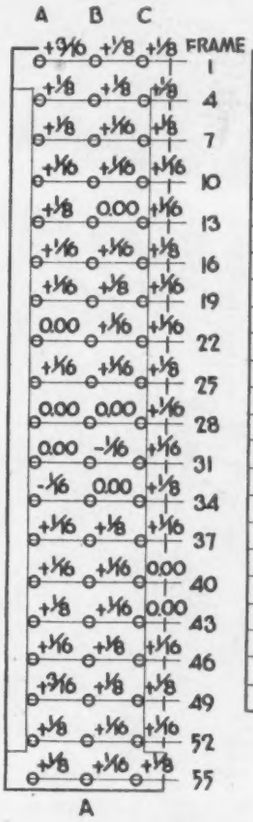
**System of control developed by Navy welding engineers in joining sections of huge steel floating dry docks reduces excessive distortion to a minimum**

DISTORTION in welded structures may be caused by a number of factors. It may be due to welding techniques, welding, heat, atmospheric conditions or welding and erection sequences. Numerous articles have commented on the mechanics of corrective measures to overcome distortion. Actually, however, no corrective measures will prove adequate unless periodic spot checks are made to keep the weldment within certain tolerances.

To control excessive distortion in the construction of steel floating dry docks during the war, a new technique was devised by welding enginners of the Navy's Bureau of Yards and Docks, working in collaboration with contractors' field engineers. Application of this technique to mammoth steel floating dry docks of 1000 to 100,000 tons capacity, reduced distortion to a previously impossible minimum.

Problem which confronted field forces of the bureau was that the docks were developing a hog or a sag amidships. Welding sequences were introduced and small weldments were produced without too much distortion. But, when it came to producing pontoon decks and wing decks from 200 to 622 ft in length, within a tolerance of 1 in. plus or minus of their theoretical mold line, it seemed an impossibility.

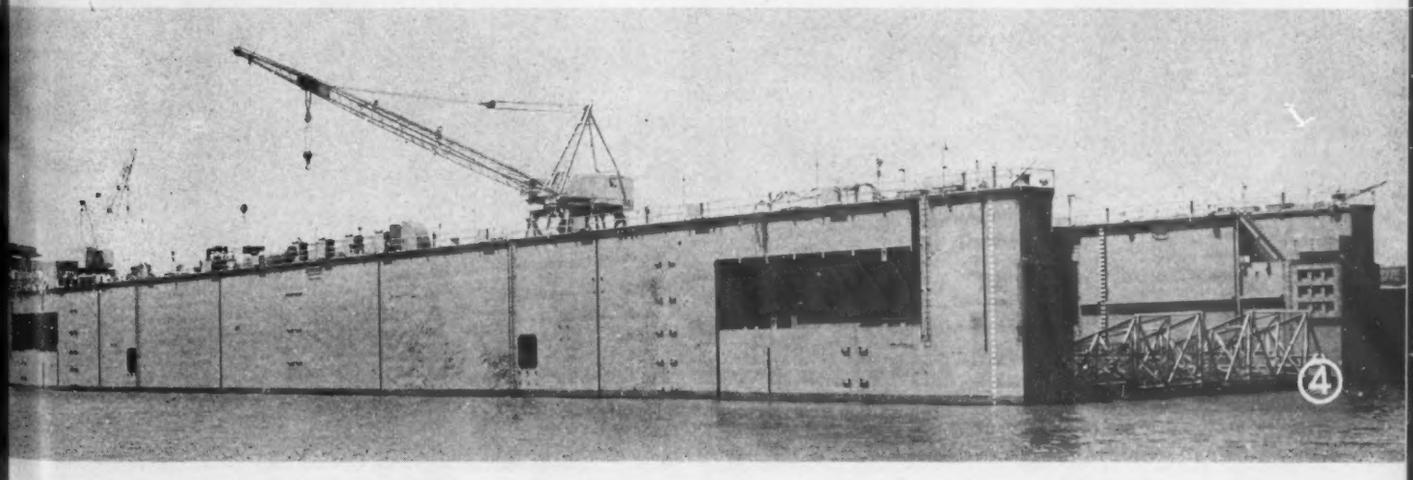
Various methods were tried, including the setting of taut steel wires throughout the cribbing on the ways by transit and level, for measuring (*Please turn to Page* 150)

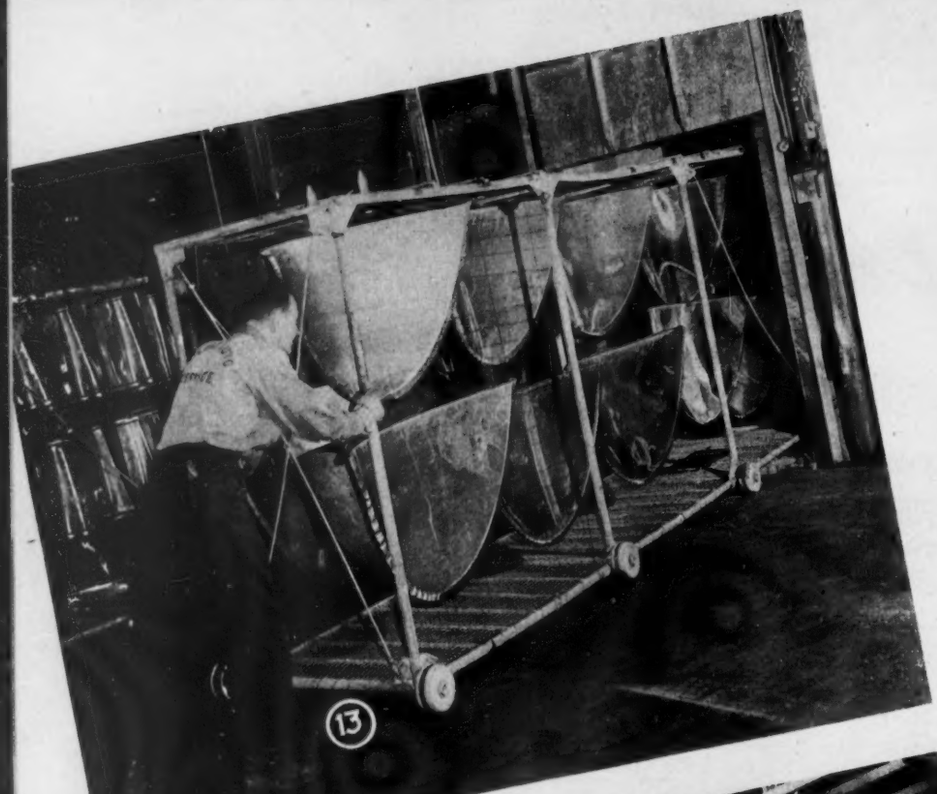


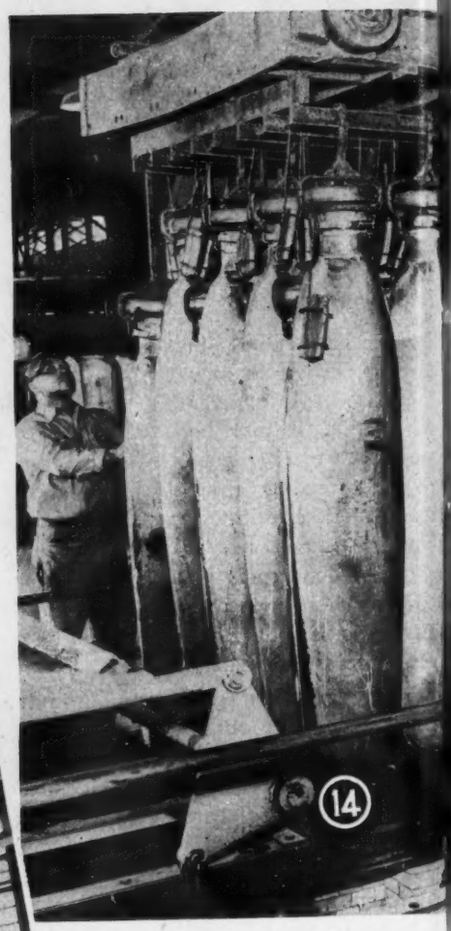

| FRAME | ELEVATIONS DOCK FLOOR | | |
|---|---|---|---|
| | LINE A | CENTERLINE | LINE B |
| BM | | IRON | |
| 1 | +3/16 | +1/8 | +1/8 |
| 4 | +1/8 | +1/8 | +1/8 |
| 7 | +1/8 | +1/16 | +1/8 |
| 10 | +1/16 | +1/16 | +1/16 |
| 13 | +1/8 | 0.00 | +1/16 |
| 16 | +1/16 | +1/16 | +1/8 |
| 19 | +1/16 | +1/8 | +1/16 |
| 22 | 0.00 | +1/16 | +1/16 |
| 25 | +1/16 | +1/16 | +1/8 |
| 28 | 0.00 | 0.00 | +1/16 |
| 31 | 0.00 | -1/16 | +1/16 |
| 34 | -1/16 | 0.00 | +1/8 |
| 37 | +1/16 | +1/8 | +1/16 |
| 40 | +1/16 | +1/16 | 0.00 |
| 43 | +1/8 | +1/16 | 0.00 |
| 46 | +1/16 | +1/8 | +1/16 |
| 49 | +3/16 | +1/8 | +1/8 |
| 52 | +1/8 | +1/16 | +1/16 |
| 55 | +1/8 | +1/16 | +1/8 |

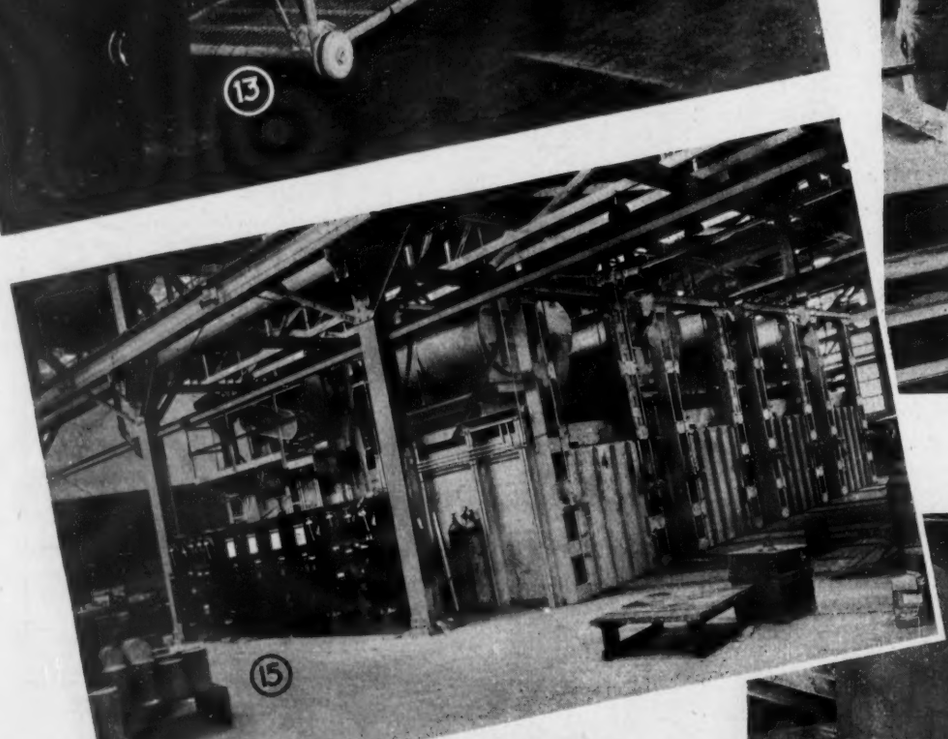
NOTE: 0.00=CENTERLINE AT FRAME #28

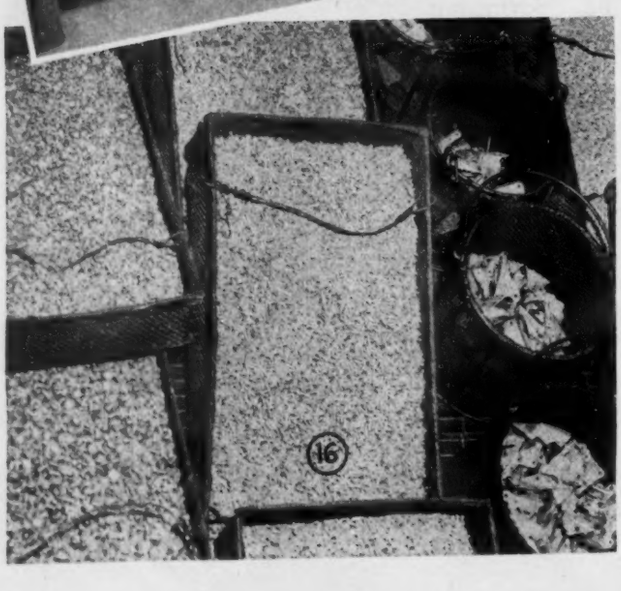
B

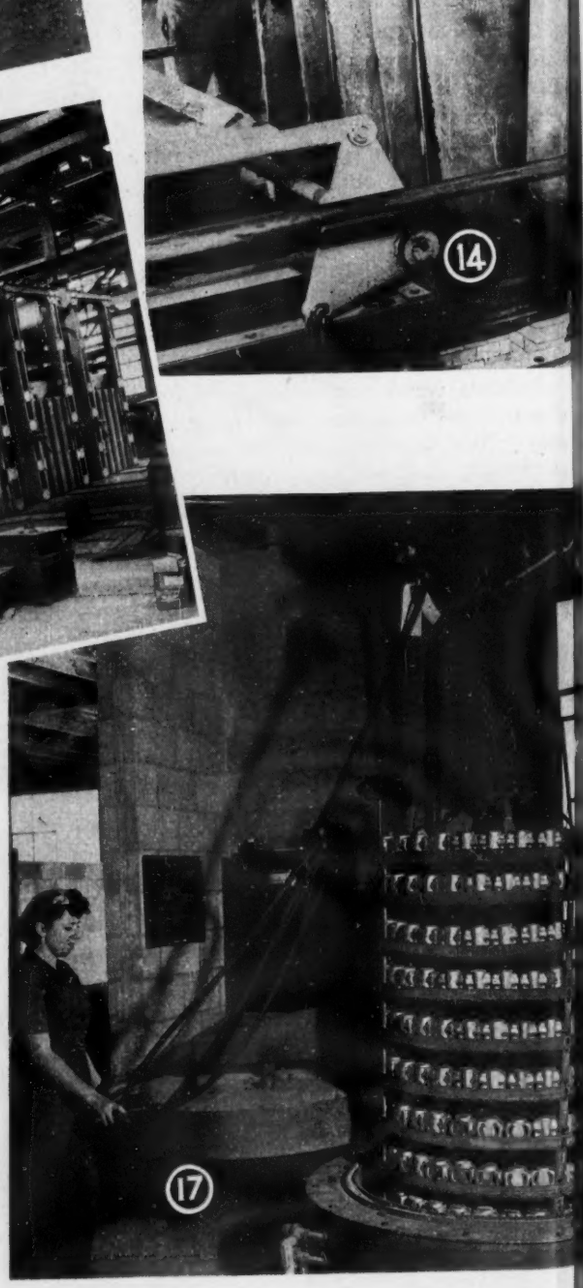












# HEAT TREATING Aluminum

By O. L. MITCHELL
*Metal'urgist*
Reynolds Metals Co.
Louisville, Ky.

*Metallurgical factors which should be observed by plants heat treating aluminum are discussed in third article of series. Heat treating cycles, equipment, atmospheres, etc., will be covered in succeeding two articles*

WROUGHT aluminum alloys are divided into two main classifications—the nonheat-treatable (common) alloys and the heat-treatable (strong) alloys.

Nonheat-treatable alloys contain elements, groups of elements, or constituents that are either insoluble in aluminum or remain substantially in solid solution. Included in this group are the high purity alloys such as 99.75 and 99.5 per cent aluminum, foil, reflector sheet, and the alloys 2S, 3S, 52S, and 56S.

Various tempers are produced by definite amounts of cold work after an annealing process. Annealed material is referred to as being in the "O" temper. When sufficient cold work has been performed to raise the tensile strength to the maximum commercially feasible, the material is referred to as being in the fully hard or "H" temper. The intermediate tempers, ¼H, ½H, and ¾H are produced by subjecting the material to plastic deformation to such a degree that the tensile strength is increased above the O properties by the appropriate fraction of the overall increase in strength commercially feasible by such methods (i.e. the difference between the H and O tensile strengths).

Heat-treatable alloys contain elements, groups of elements, or constituents that have considerable solid solubility at elevated temperatures and restricted solubility at lower temperatures. Included in this group are the high copper-bearing alloys, 11S, 14S, R301, 17S, R317, and 24S; the magnesium silicide type alloys, R353 and R361; and the zinc-bearing alloy, R303.

These alloys are strengthened principally by thermal treatments supplemented by plastic deformation in special cases. As stated, annealed material is referred to as being in the O temper. Immediately after solution heat treatment, the material is sometimes referred to as being in the freshly quenched (FQ) condition.

The alloys 17S, and 24S are known as natural aging alloys since they precipitation harden at room temperature. The alloys that require an artificial aging treatment also age a limited amount at normal temperatures, the degree of hardening being dependent upon the alloy. Those alloys that do not attain full strength and hardness after natural aging for a few days after quenching are referred to as being the "W" temper. After fully aging, either naturally or by a thermal treatment, the alloys are referred to as being in the "T" temper.

Material that has received no thermal treatment after the final plastic deformation operations is referred to as being in the "as fabricated" or "F" temper. Solution heat-treated and aged material that has received cold work is referred to as being in the "RT" condition.

**Clad Alloys:** Several of the high-strength alloys available in cladded form are produced by bonding layers of highly corrosion resistant material to a core of different type material. By this means, a material is produced that has special desired combinations of characteristics. For example, Reynolds Pureclad is a sheet and plate product with surface layers of high-purity aluminum to provide high corrosion resistance, reflectivity or similar special properties. If an alloy cladding is used, the material is referred to as being a clad product.

**Wrought Alloys—Fundamentals:** When molten pure aluminum is cooled, its temperature drops until it reaches 1214.6° F, at which time the material gives up its latent heat of fusion and solidifies in a form known as dendritic. After the entire mass solidifies, the temperature again declines as the cooling process continues.

However, the addition of soluble elements to aluminum to produce the alloys exerts a pronounced influence on the behavior of the material during the cooling period, due to the formation of primary solid solutions. Instead of solidifying at 1214.6° F, the material starts to freeze at a lower temperature and is completely solidified at a still lower temperature. The temperatures at which solidification starts and ends, referred to as the liquidus and solidus temperatures, are dependent upon type and

*Fig. 13—Fabricated aluminum parts being loaded into a batch type recirculating air furnace. Photo courtesy Lockheed Aircraft Corp.*

*Fig. 14—Lowering car of propeller blades into automatic continuous recirculation type furnace. Cars are automatically pushed through the heating chamber, rapidly removed, quenched. Photo courtesy Electric Furnace Co.*

*Fig. 15—Typical 4-furnace setup with automatic controls used for heat treating aluminum alloys at Reynolds*

*Fig. 16—Large quantities of small parts such as rivets are easily heat treated in mesh baskets. Photo courtesy of Boeing Aircraft Co.*

*Fig. 17—Furnace utilizing high velocity, forced-air circulation assures fast and uniform heating of densely packed loads. Waukesha Foundry Co. photo*

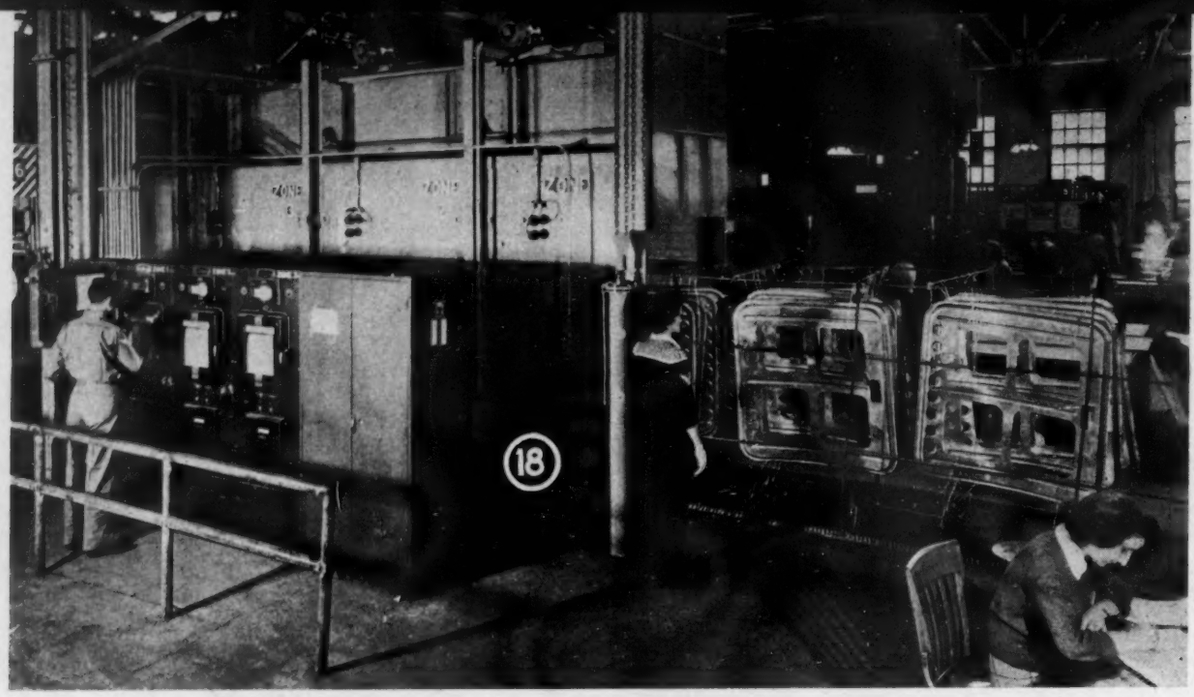


*Fig. 18—Car type heat-treating furnace handling fabricated parts at Reynolds. Unit employs automatic controls for 3-zone heating*

amount of the various elements added to produce the alloy.

The first portions of the melt to freeze, which usually contain very limited quantities of the alloying elements, start the formation of the grains or dendrites. As the temperature continues to drop, successive layers, containing increasing amounts of the soluble elements, solidify on the previous portion to form dendrites. Last portion of metal to solidify contains a large portion of the elements added to the aluminum. Generally this material forms a brittle phase, known as a eutectic, which freezes between the dendrites.

Presence of the layer of brittle material between the dendrites, the shape and distribution of the soluble and insoluble constituents, and the shape and size of the dendrites causes the as-cast material to have points of weakness. However, many of these inherent weaknesses can be alleviated or eliminated by homogenizing thermal treaments and by "breaking down" the as-cast structure with mechanical working processes.

Usually the first mechanical work is done with the material heated to give maximum plasticity. Subsequent plastic deformation processes may be performed either hot or cold, depending upon the shape and properties desired in the final product. After the as-cast structure of the material has been altered, the material is referred to as being in the "wrought" form.

**Plastic Deformation:** This technique is used to alter the as-cast structure of a material, to fabricate an alloy to its desired shape, and to harden and strengthen the class of alloys known as the nonheat-treatable alloys. When a metal is subjected to sufficient stress, such as is produced by plastic deformation, slippage occurs along definite crystallographic planes. The number of planes upon which this slippage can take place is entirely dependent upon the crystal structure of the metal.

Aluminum, as well as most of the other easily worked metals, crystalizes in a form known as the face-centered cubic structure which possesses more effective slip planes than any other structure. Metals that possess this crystal structure can, therefore, be plastically deformed severely before rupturing occurs.

When aluminum is subjected to plastic deformation, slippage takes place along the slip planes that are most favorably oriented in regards to the direction of the applied stress. As slippage continues, the planes which are slipping change their positions in such a manner that they become less favorably oriented to be applied stress than are other planes, therefore slippage begins along these other planes. As the degree of plastic deformation progresses, the planes continue to change their orientations and the metal becomes increasingly difficult to work.

The changing of the positions of the slip planes, often referred to as "rotation" of the slip planes, produces a condition wherein a substantial number of the planes have the same orientation. This condition is known as preferred orientation and is one of the reasons why some material forms "ears" when deeply drawn.

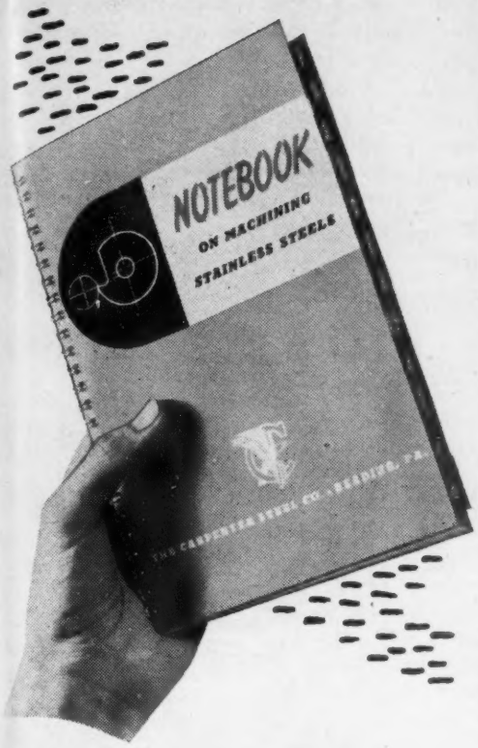
Direction of the preferred orientation in cold-worked aluminum depends upon the thermal treatments, the degree of plastic deformation, and the direction of the applied stresses which produced the orientation. There may be preferred orientation in more than one direction. For example, the processes used in the production of wire, and in some cases extruded shapes, often produce a condition known as the double fibered structure which contains preferred orientation in two principal directions.

The slipping of the planes naturally causes fragmentation of the grains. Increasing the degree of cold working increases the amount of fracturing of the grains that take place, with the grain becoming elongated. The amount and the directions of the elongation are closely associated with reduction of cross-sectional area and direction of working.

Cold working increases the total internal energy of the material, thereby producing an unstable condition. The amount of extra energy stored in the material is dependent upon the degree of cold work and upon the inherent characteristics of the material.

Due to preferential slippage, this extra energy is not equally distributed throughout the material but is more concentrated at certain points, giving them exceptionally high energy values. These highly stressed points, being less stable than the remaining portion of the material, serve as nuclei in the formation of new grains during the recrystallization process.

Slippage along the slip planes is restricted in several ways. The distortion of the space lattice by atoms of other elements in a solid solution or by mechanical strain restricts slippage. The presence of insoluable or precipitated constituents can exert a keying effect which also restricts slippage. Small grain size is still another factor, in this case it is due to the interference of the grain boundaries. There are many other fac-

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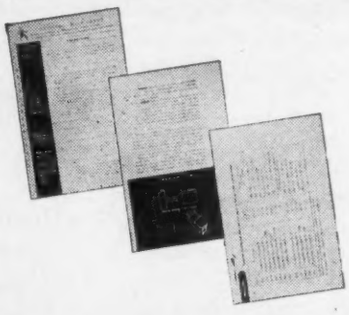

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tors, such as interatomic cohesion forces, but the above are the major ones closely associated with plastic deformation.

Cold working aluminum increases the tensile strength, the yield strength and the hardness, but decreases the ductility properties such as the per cent elongation, the impact strength and the formability.

Recovery takes place during the initial stages of an annealing or a solution heat-treating process. During this period some of the internal stresses are relieved with a recovery of part of the ductility lost during the cold working operations. Degree of stress relieval during the recovery period is dependent upon both time and temperature. With some alloys, particularly 3S, a fast heating rate through this period is essential for the production of fine-grained material. If the heating rate is slow, the elimination of the highly stressed points, produced by cold working, may be sufficiently great to produce a coarse-grained material upon recrystallization.

Recovery is the principal reaction that takes place during the annealing of hot-worked material (material plastically deformed above the recrystallization temperature). This is also true for material that has received an amount of cold work insufficient to cause recrystallization.

**Recrystallization:** When cold worked material is heated to a sufficiently high temperature, the fragmented particles, produced by the cold working process, form new unstrained grains provided sufficient cold work has been performed on the material. This is recrystallization.

The high energy points created during the cold working process serve as points of nucleation for the formation of the new grains. The formation of the new grains removes a substantial amount of the effects of the cold work, tending to produce properties similar to those originally possessed by the material.

Degree of cold work is important; an insufficient amount prevents occurrence of recrystallization; "just enough" cold work produces material with a very coarse grain size whereas presence of a substantial amount of cold work promotes formation of fine grained material. There are several recognized fundamental laws of recrystallization: (1) Increasing the degree of cold work decreases the temperature necessary for recrystallization. (2) Increasing the length of time at temperature decreases the recrystallization temperature. (3) The rate of heating to and through the recrystallization temperature affects the size of the grains formed. (4) The degree of cold work and the temperature employed affect the size of the grains formed.

It is usually desirable to have a material possessing a medium-to-fine grain size for severe drawing operations. While large grained material actually has a greater capacity for plastic deformation than fine grained material, such material also has a greater tendency to deform locally or neck down, and may produce an undesirable surface appearance known as orange peel.

The final grain size of a recrystallized material is dependent upon the size of the grains after recrystallization and upon grain growth. These, however, are influenced by many factors, such as:

(A) Original grain size
(B) Degree of cold work
(C) Heating rate
(D) Final temperature
(E) Length of time at temperature
(F) Composition

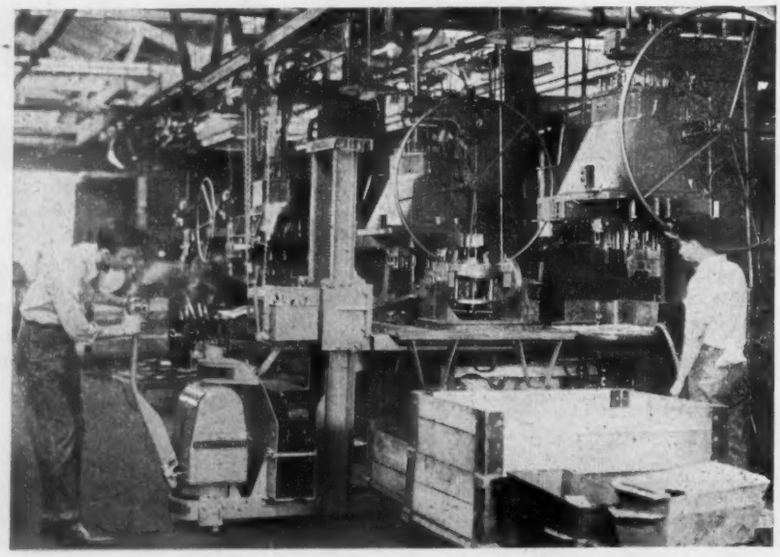
(A): The effect of the grain size of the orginal material on the recrystallization process is apparent only with small degrees of cold work. The degree of strain hardening obtained by a given amount of cold work is dependent on the grain size of the original material, being less for large grained material. For equal amounts of strain hardening, the original grain size has no appreciable effect on the final grain size. It is only in cases where the amount of plastic deformation is slight that the grain size of the original material has a noticeable affect on the final grain size.

Many forming operations are such that a portion of the metal is worked a critical amount, producing an area of large grains upon recrystallization. This condition can be alleviated by the proper choice of alloy temper and by controlling the degree of cold work between thermal treatments.

(B): Material that has received a limited, but critical, amount of cold work may have an abnormally large grain size after recrystallization. For this reason, controlled amounts of cold work between thermal treatments is standard mill practice. There may, however, be an occasional application where a portion of the metal receives just enough strain hardening to put it in a critical zone which, upon recrystallization, forms coarse grains.

For example, the extrusion process (used to produce shapes) often works the metal in such manner that both recrystallized and unrecrystallized structures may be present after thermal treatment. Some of the larger heat-treatable extruded shapes possess a band of fine recrystallized grains near the surface, then a layer of large recrystallized grains, and finally an area of unrecrystallized material. Degree of cold work that produces these abnormally large grains is always small, depending upon the alloy, the type of cold working, as well as the heating rate and maximum temperature of subsequent thermal treatment.

(C): The heating rate during a thermal treatment may affect the grain size of a few of the alloys regardless of the degree of cold work present. Evidently



**SMALL BUT MIGHTY: Movements of above Transtacker manufactured by Automatic Transportation Co., Chicago, are "finger-tip" controlled in positioning a heavy fixture on a drill press. Versatile industrial truck handles work of high-lift platform and fork lift trucks where size and weight make larger units impractical. Made to clear 7-ft doors, unit raises loads of 4000 lb to a height of 68 in. According to Elmer F. Twyman, general manager of Automatic, prices for all models are below $2100**

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a slow heating rate permits the recovery period to exert a greater than normal influence, with the resulting recrystallized grains being somewhat larger. It should be recalled that some of the stresses which promote recrystallization are relieved during the recovery period.

(D): After recrystallization, the new grains are subject to growth. This growth is caused by the tendency of the grains to revert to their lowest energy form. Increasing the final temperature theoretically promotes grains growth. However, with aluminum alloys, the advantages gained by a fast heating rate often completely overshadow the advantages of using a lower temperature.

In the majority of cases the practices for the various thermal treatments are controlled by factors other than grain growth after recrystallization, the final grain size being affected to a greater degree by other factors.

(E): Increasing the time at temperature promotes grain growth. However, considerations other than grain growth are of far more practical importance when establishing procedures for the various thermal treatmenth. Abnormally long soaking periods should be avoided for metallurgical reasons given later.

(F): The inherent characteristics of the various alloys play a very important role in the final grain size of material subjected to thermal treatment. With some alloys, such as 2S, the heating rate is not considered critical, while with other alloys, such as 3S, a relatively fast heating rate is an absolute necessity if fine grained material is desired. The practices given for the various thermal treatments consider these characteristics.

**Annealing, Basic Principles:** Many fabricating procedures for the wrought aluminum alloys incorporate an annealing treatment. The anneal may be required to remove the effects of plastic deformation or to soften solution heat-treated and aged material. The practices used for each of these types of material are different but their purposes are identical—to obtain material of optimum workability.

To obtain annealed material with optimum workability, the following requirements should be met:

Complete recrystallization
Equiaxed grains of optimum size
Random orientation of slip planes
Low degree of solid solution
Uniform distribution of insoluble and precipitated particles
Optimum size insoluble and precipitated particles

It should be realized that these are ideal requirements that are seldom completely fulfilled in actual practice. However, they are the basis upon which annealing practices are set. Any change from the annealing practices given should be taken with these points under consideration.

**Mechanics of Annealing:** Recovery takes place during the initial stages of the annealing process. During this period some of the internal stresses are relieved with a recovery of part of the ductility lost during preceding cold working operations. As the annealing process continues, the temperature becomes sufficiently high to permit the fragments of the original grains to recrystallize or form new unstrained grains. This, of course, will take place only if sufficient cold work is present in the material.

After recrystallization, the new grains are subject to growth, due to the tendency of the grains to revert to their lowest energy form. However the final grain size of annealed material generally is not substantially affected by grain growth after recrystallization. A notable exception is high-purity aluminum.

There is no definite breaking point between the periods of recovery, recrystallization, and grain growth. It is known that the recovery period comes first and that grain growth must, of necessity, be after recrystallization. Since the recrystallization process is a time-temperature-stress reaction, it is entirely probable that recovery, recrystallization and grain growth are occurring simultaneously in various parts of the material.

**Effect of Soluble Constituents:** Basically, the mechanics of annealing all cold-worked material is the same, but the addition of the elements used to produce the heat-treatable class of alloys makes it necessary to modify the practices used with these alloys.

Heat-treatable alloys contain elements that possess considerable solid solubility at high temperatures and restricted solubility at lower temperatures. Annealing practices, therefore, must be such that the effects of cold work are removed without obtaining a solution heat-treating effect.

**Effect of Previous Heat Treatment:** The annealing of solution heat-treated and aged material requires additional modification of practices because the finely dispersed precipitate must be coalesced by using a higher than normal temperature. However, at this temperature solution of the precipitate is also occurring. Therefore, after coalescence, a slow cool is required to allow the constituents that went into solution to re-precipitate.

*(Continued next week)*

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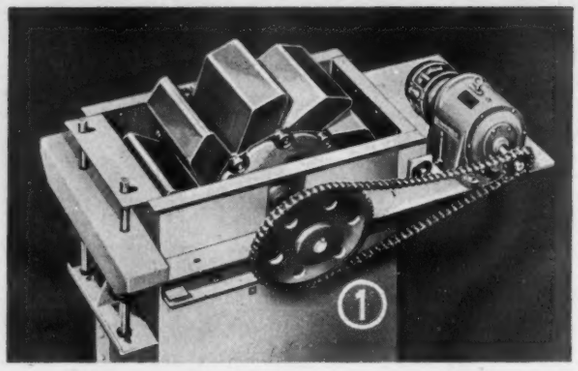
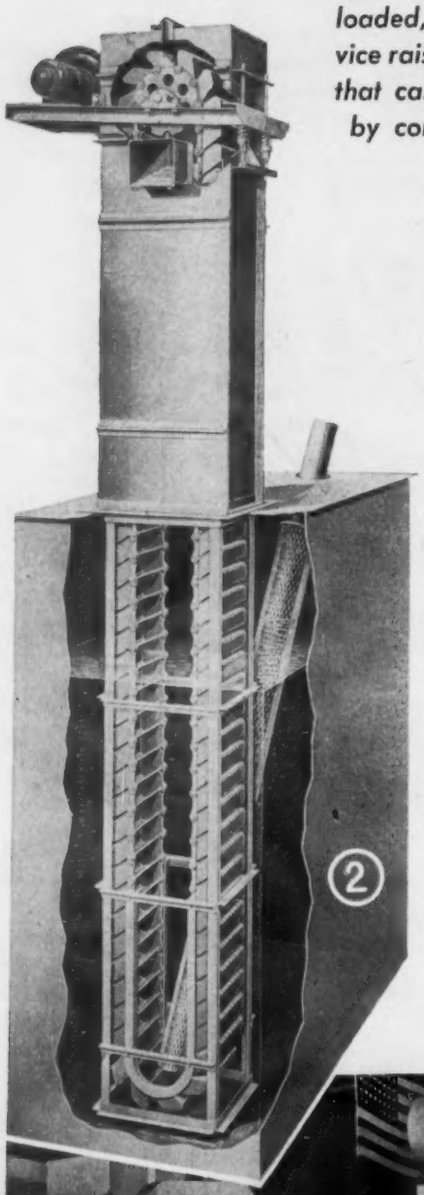




# Loop-type BUCKET ELEVATOR

## HANDLES DELICATE PARTS

WHEN the Army Ordnance department set its sights on monthly delivery of a billion rounds of machine gun ammunition, traditional arsenal handling methods were found to be unable to supply parts in sufficient quantity to meet the accelerated demand. An internally loaded loop-type elevator designed for continuous operation was developd by Link-Belt Co., Chicago, to handle parts including disks, cups, cases, bullet jacket cups and other components.

The bucket elevator is now adapted to peace-time handling of small, delicate, manufactured parts such as bolts, nuts, stampings, through a generally upward motion. Elevating medium consists of an endless series of overlapping inwardly-opening continuous buckets supported on the pins of a wide strand of SS type steel roller chain which is operated slowly over sprocket wheels at top of lift, Fig. 1, and at foot is guided by curved steel angle tracks.

Buckets are open only in the back to permit internal loading at foot, from chute extending directly through the side of the steel casing which encloses the elevator. Material flows directly into open backs of buckets.

Elevator is loaded on both sides, either

(*Please turn to Page* 149)

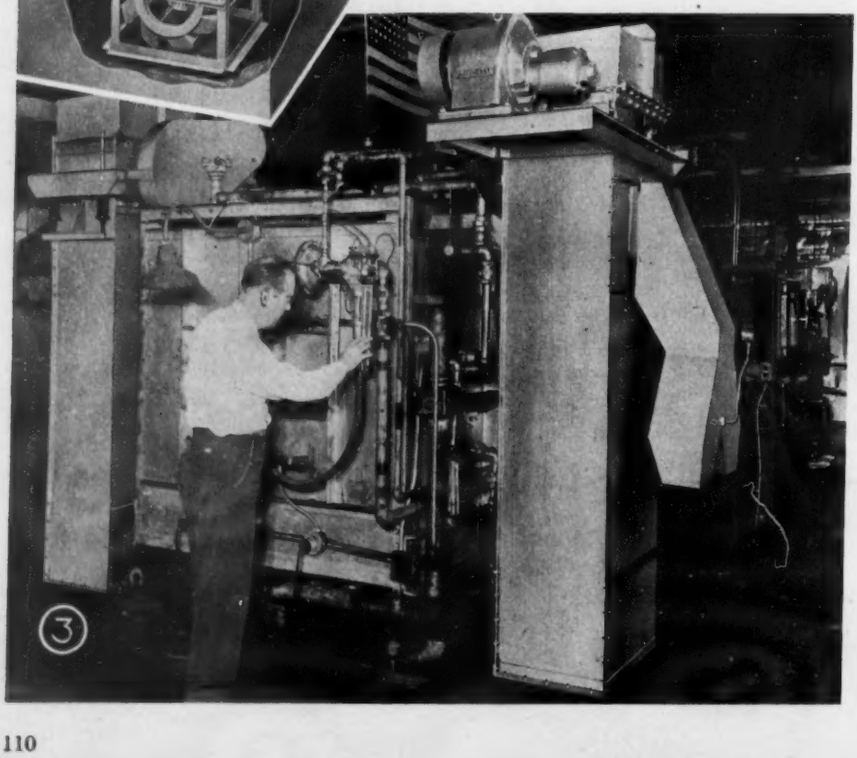
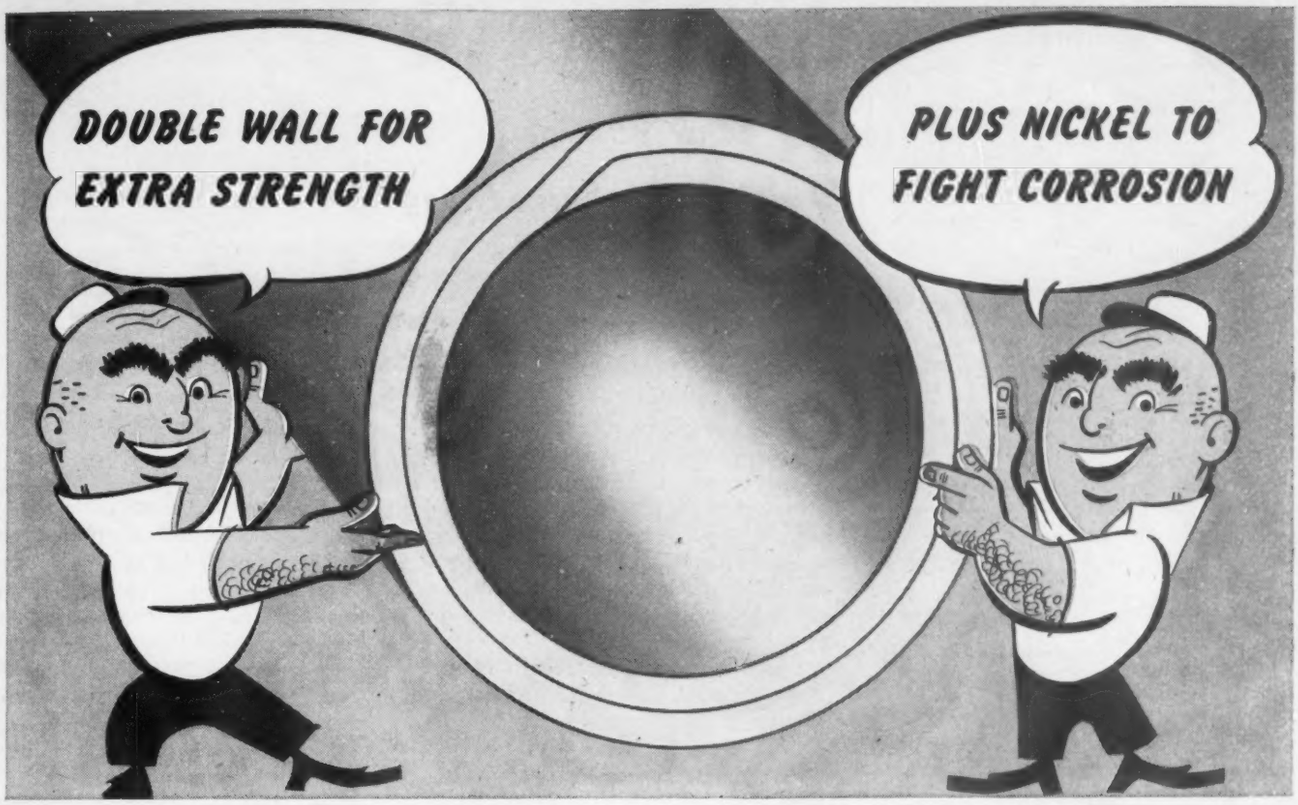


*Fig.* 1 — *Unloading zone showing buckets, head sprockets and arrangement of take-up and drive of internally-loaded, loop-type bucket elevator*

*Fig.* 2—*Single head shaft type elevator lifts metallic pieces out of oil quench tank. Perforated buckets permit oil to drain back into the tank*

*Fig.* 3—*After heat treatment parts are quenched in tank located under elevating installation shown here at right center*

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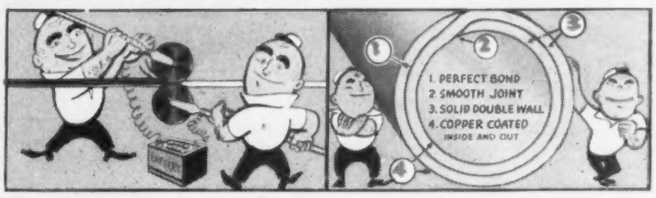


3 fuses and alloys with the Monel or nickel, forming a perfect bond between the two walls and disappearing from the inner and outer surfaces. After cooling, it is a solid, double walled tube . . .

4 copper-brazed throughout 360° of wall contact, free from scale and closely held to dimensions. Hard or annealed in standard sizes to 5/8" O.D. Special sizes cold drawn.

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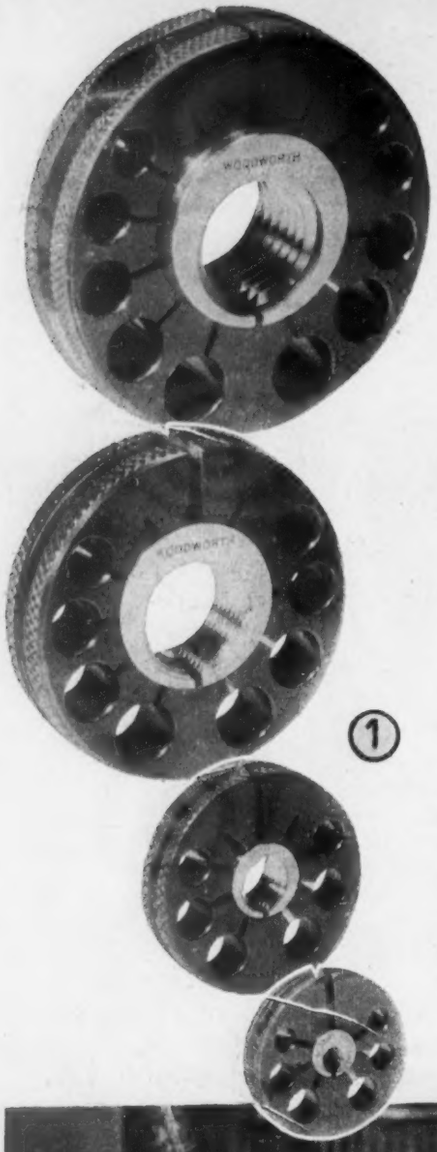


## New Principle Developed in Thread Ring

# Gage Design

By A. H. ALLEN
Detroit Editor, STEEL

RING gages, both plain and threaded, find many uses in the metalworking industry. Conventional types are of hardened tool steel, ground and lapped to size. Plain ring gages are usually of the one-piece solid construction since they can be comparatively easily finished to size and reconditioned by chromium plating.

Thread ring gages are seldom of the solid type because of the cost in making them to a fixed size, and also because of the comparatively short life of such a gage. For this reason, the so-called adjustable thread ring gage of American gage design standard has been in use for a long time and universally accepted. Engineers and inspectors, however, have recognized its shortcomings, including:

**1. Out of Roundness.** This fault is created by lapping the ring on a solid lap, the pitch diameter of which is larger or smaller than the pitch diameter of the intended gage. The ring gage thus lapped is then expanded or contracted to fit a setting plug (often furnished with the gage). This setting plug apparently fits the gage but actually has only a three-spot bearing, as may be proved by "blueing in". The result is a short gage life. Even if the new gage is lapped round and to the correct diameter, the first adjustment will change the circular contact into a shape approaching a triangle, as shown in exaggerated form in Fig. 3.

**2. Out of Plane.** The common ring gage (AGD standard) features in its adjusting device a sleeve which is in-

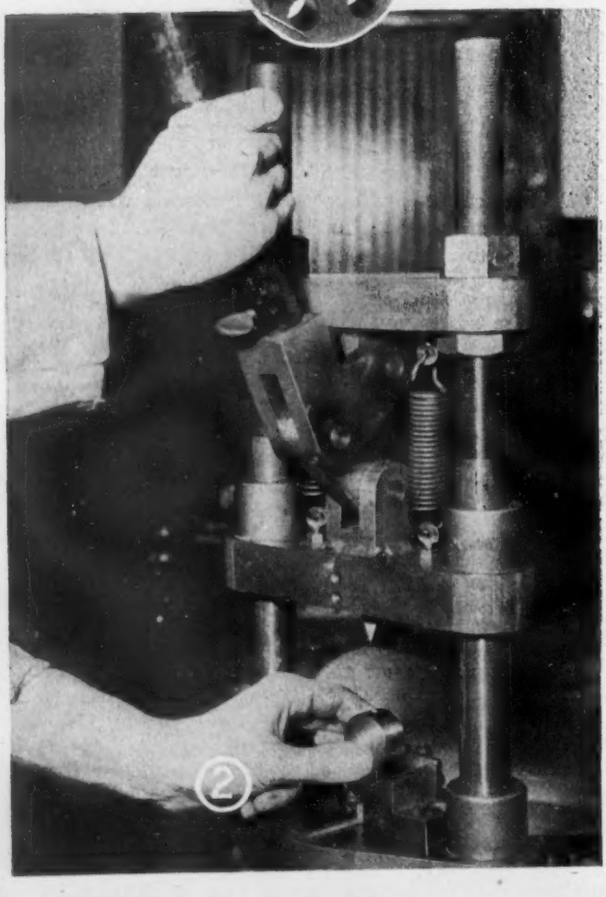
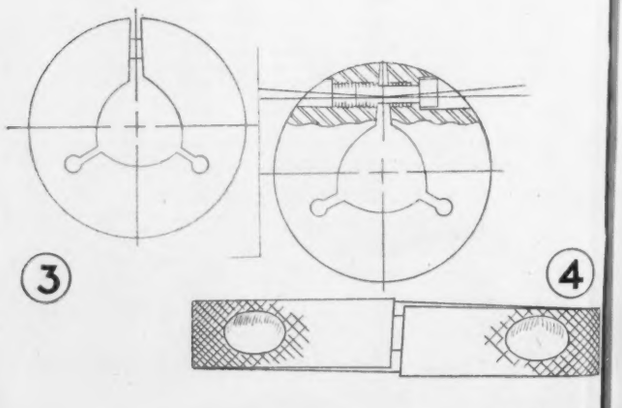


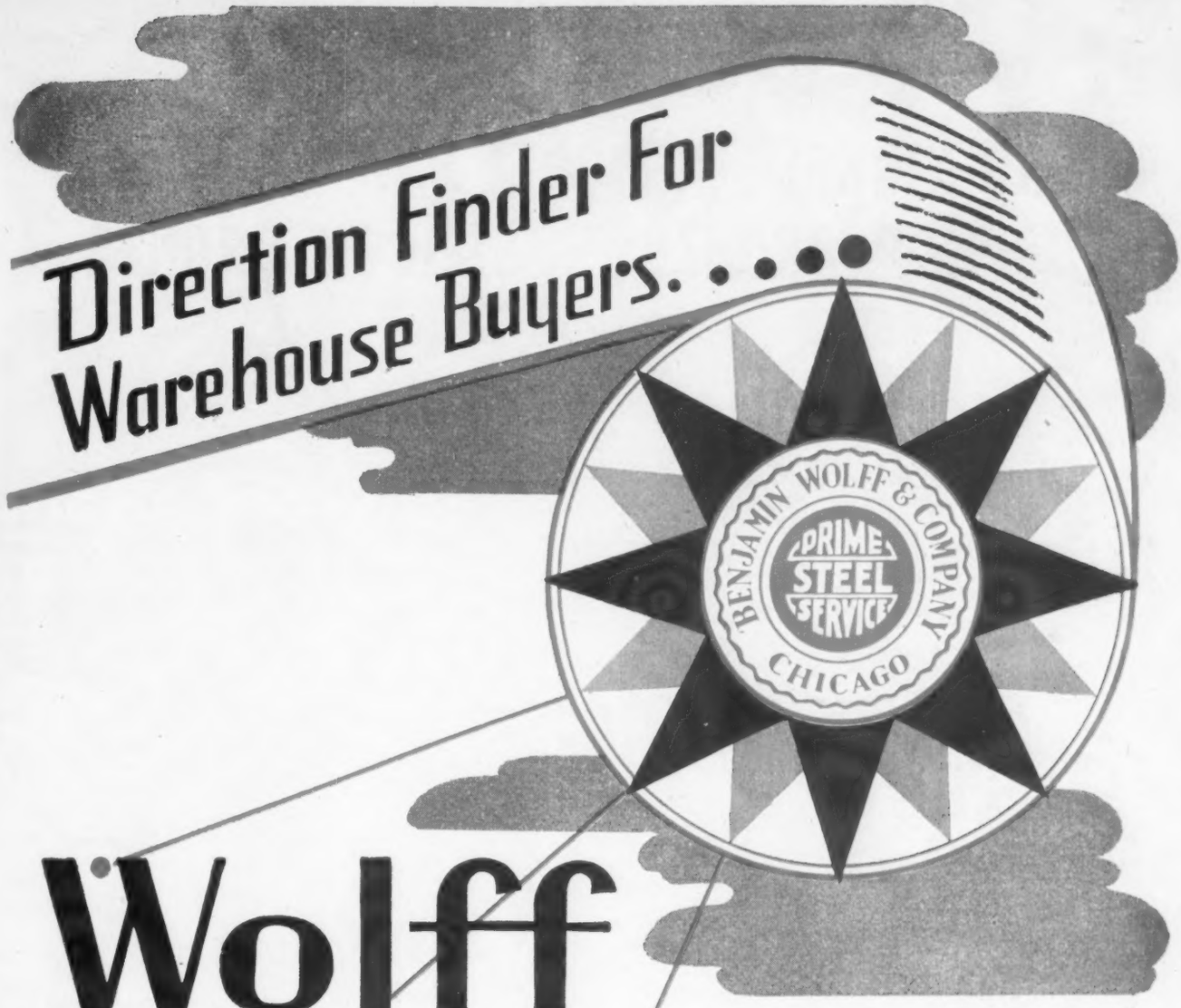
*Fig. 1—Four sizes of adjustable thread ring gages, featuring tool steel gage inserts and anodically colored aluminum alloy knurled shells*

*Fig. 2—Coining operation on drill spot at center of adjusting slot (still to be cut) on the insert. This is done to provide pyramidical seat for adjusting screw to maintain alignment after adjustment*

*Fig. 3—Sketch showing in exaggerated form the tendency toward triangular contact in adjustable ring gage*

*Fig. 4—Sketches showing (above) tendency toward bending of sleeve around adjusting screw, and (below) out of plane conditions as adjustment is tightened; both somewhat exaggerated for purposes of illustration*



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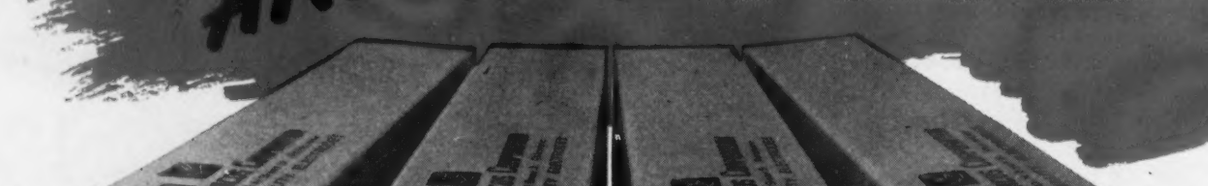
*Here are time tested* **ARCOS ELECTRODES to weld them***




*70/30 CuNi*
### NICUEND

**Electrodes with spray type arc for depositing Cupro-Nickel alloy weld metal commonly known as 70/30.**

*Monel*
### MONEND

**Electrodes with spray type arc for depositing a Monel weld metal.**

*Phos-Bronze*
### BRONZEND P

**Electrodes for depositing highest quality Phos-Bronze weld metal.**

*Everdur*
### BRONZEND E

**Electrodes for depositing corrosion resisting bronze weld metal.**

***While these electrodes are used for welding base metals of a similar analysis, they may also be used for special applications when the base metal or metals are different. Contact your distributor for specific recommendations.***

***WHEN SO MUCH DEPENDS ON SO LITTLE . . . BE SURE, USE ARCOS***

ARCOS

**ARCOS CORPORATION • 318 GULF BUILDING, PHILA. 2, PA.**

*Your Arcos Distributor is well informed. Your Arcos Distributor has Stock.*

**NEW ENGLAND AND N. Y. CITY**

**Hartford 2, Conn.** . . . . . Arcos Corp.

**MIDDLE ATLANTIC**

**Buffalo, N. Y.** . . . . . Root, Neal & Co.
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**Philadelphia, Pa.** . . . . . Arcos Corporation
**Pittsburgh, Pa.** . . . . . Williams & Co., Inc.
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**Baton Rouge 17, La.** . . . . . Louisiana Welding Co.
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**Kingsport, Tenn.** . . . . . Slip-Not Belting Corp.
**Knoxville, Tenn.** . . . . . Slip-Not Belting Corp.
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**New Orleans, La.** . . . . . The Gulf Welding Equipment Co.
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**Pampa, Texas** . . . . . Hart Industrial Supply Co.
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**MIDDLE WEST**

**Chicago, Ill.** . . . . . Machinery & Welder Corp.
**Cincinnati, Ohio** . . . . . Williams & Co., Inc.
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**San Francisco, Calif.** . . . . . Victor Equipment Co.
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**FOREIGN**

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**Monterrey, N. L. Mexico** . . . Electrodos Monterrey, S. A.
**Montreal, Canada** . . G. D. Peters & Co. of Canada, Ltd.
**Chile, Bolivia, Peru** . . . . . W. R. Grace Company
**San Jose, Costa Rica, A. C.** . . . . . Distribuidora S. A.
**San Juan 6, Puerto Rico** . Frank Rullan & Associates, Inc.

tended to fit like a dowel pin in the free ends of the gage body adjacent to the "through" slot, so as to keep the ends in one plane after slotting. It has been tried to make such a "dowel pin fit" on this sleeve, with the result that the size adjustment was found to be inadequate. The only way the size adjustment will function properly is to make the sleeve fit rather loosely, as otherwise the size adjustment would require bending the sleeve, as indicated in Fig. 4.

In an effort to overcome these deficiencies, engineers of the N. A. Woodworth Co., Ferndale, Mich., worked out an entirely new principle in the design of adjustable thread ring gages. It was arrived at only after extensive experiments with many various modifications of the conventional type of ring gage, most of them being different designs of slotted and notched inserts with concentric holes, in solid and standard shells. Each design was studied in detail from the point of view of both production and the maintenance of roundness on adjustment. One objection encountered in inserts with equispaced notches around the outer periphery was that they were a source of cracking in heat treatment. The ultimate design eliminates them altogether, and comprises four parts, as shown in Fig. 5:

**1. The Insert:** A tool steel bushing, slotted in one place. The inside diameter is threaded as desired. The outside diameter is eccentric with the inside diameter to such an amount that it will contract perfectly round. There is a drill spot at the center of the slot, which is coined into a pyramidical seat (section A-A in Fig. 5). Material for the bushing or insert is conventional hardened and ground tool steel of highest quality, sawed from round bar stock, machined and heat treated.

**2. The Gage Body:** It acts much like a hose clamp and exerts uniform radial pressure on the insert. It is drilled and slotted as shown, in order to reduce the weight to a minimum and to make it as flexible as possible, leaving in effect only a clamping band. The inside diameter is eccentric the same amount as the insert. It is slotted at the thinnest part of wall, drilled and tapped for a clamp screw at the slot, and tapped at the opposite side for an adjusting screw. Material used in the gage body is 17ST aluminum alloy, anodically colored either red or green, the former for "no go" and the latter for "go" gages.

**3. Adjusting Screw:** This is a hex socket type and has a special spherical dog point nose which engages the coined pyramidical seat at the slot of the insert.

**4. Clamp Screw:** This is a standard hex socket head type.

Accuracy of round contraction of the insert is claimed to be inherent in the design of the part itself. The insert eccentricity of outside diameter with inside diameter is maintained to a definite formula. The gage body is flexible so that it will not influence the roundness or straightness of the insert. The pyramidical seat at the slot of the insert insures alignment of the threaded inside diameter under all conditions of normal use.

One important feature of the pyramidical ball seat is that the diagonal axis of the pyramid is set to the helix angle of the thread in the insert. When the gage is contracted the thread elements remain in alignment across the through slot. In other words, the free ends of the insert shift sidewise, as the gage is contracted, to compensate for the helix angle of the thread.

Adjustment of this new type of ring gage is simple, the only tool needed being a small socket wrench to fit the clamp screw and adjusting screw heads. The clamp screw in the gage body is always loosened first, after which the adjusting screw is positioned to give the desired diameter of the gage. The adjustment is locked by a final tightening of the clamp

(*Please turn to Page* 146)

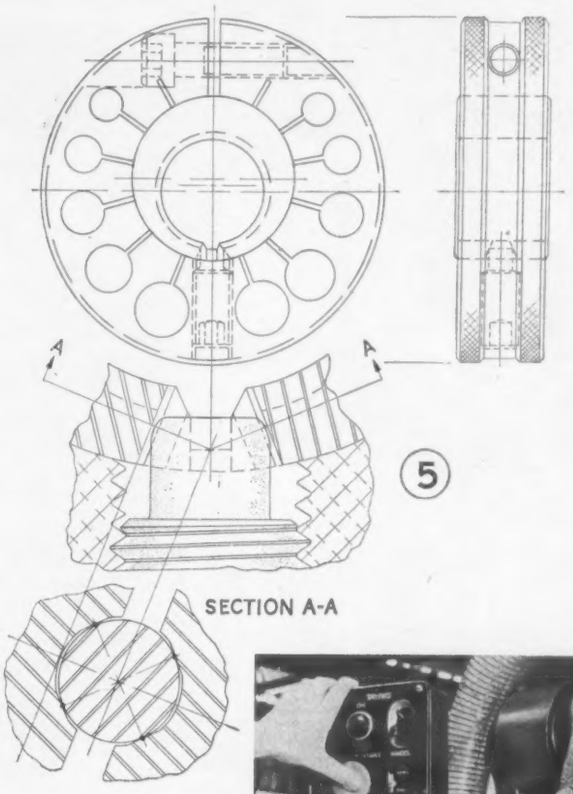



*Fig. 5—Flat and edge drawings of adjustable thread ring gage with steel insert in aluminum shell. Enlarged sections show four contact points of counterlock screw. Specially shaped hole is formed in a coining press before the insert is drilled and slotted*

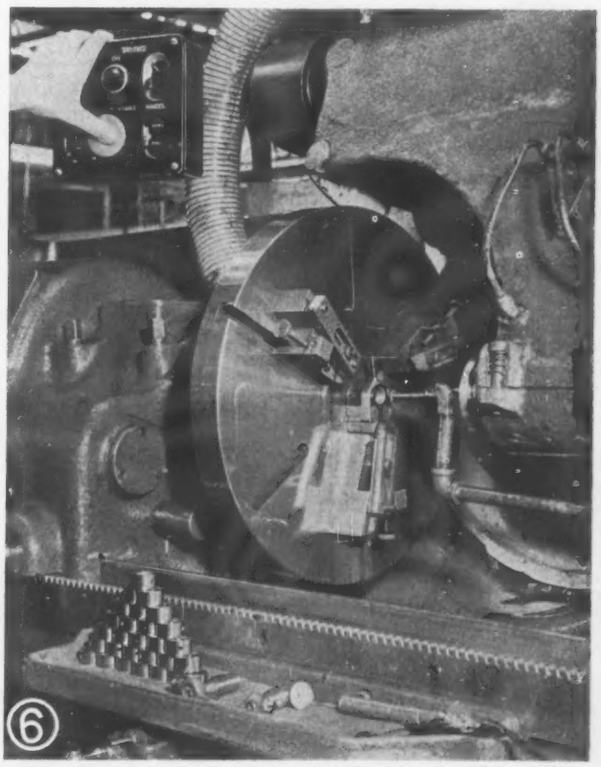
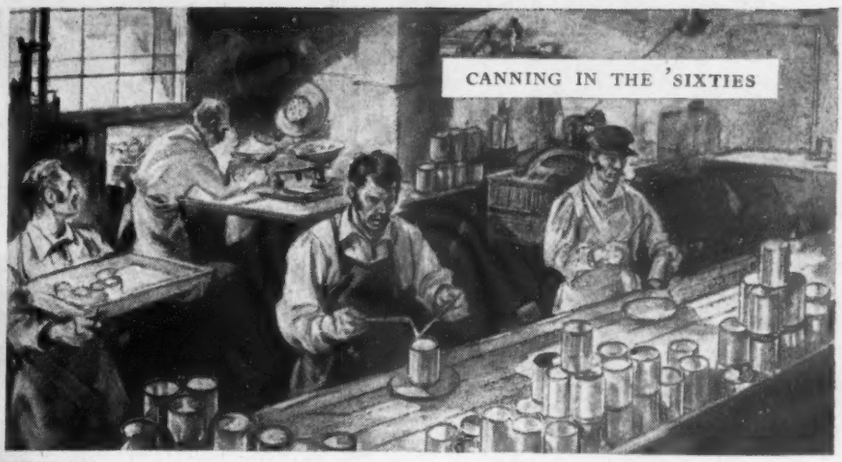



*Fig. 6—Insert mounted in fixture in thread grinder for finishing the gaging surfaces*

**FOOD PACKING PLANT**
1946

DRAWN FOR JONES & LAUGHLIN STEEL CORPORATION BY ORISON MAC PHERSON




## SEVERAL GREAT INDUSTRIES WORK TOGETHER TO BRING YOU THE BEST IN FOODS

The convenient, economical, ready-to-eat packed foods that you buy today are made possible by the close cooperation of several great American industries. These are farming, food packing, container and closure manufacturing, and the steel industry. They work with one another to bring you the best there is in foods. You get these foods garden fresh, safely packed, pressure-cooked, ready for your table at any time, in any season of the year.

America's achievements in commercial canning have made us the leader in production and preservation of foods. This enables us to share these foods with the world's distressed areas. Commercial canning facilitates universal distribution of food products. It also makes possible the storage of surplus foods. It mitigates the effects of crop failures.

The part of Jones & Laughlin Steel Corporation in the preservation and conservation of American foods is basic. J&L produces Controlled Quality tin plate used in manufacture of cans and of closures for glass containers.

Constantly improving its tin plate, J&L looks ahead to the time when commercial canning will bring to your table a still greater variety and abundance of wholesome foods, fresh from the richness of American farms, gardens, orchards and waters.

**JONES & LAUGHLIN STEEL CORPORATION**

J&L STEEL

PITTSBURGH, PENNSYLVANIA

*STRONGER, CONTROLLED QUALITY STEELS*

## CANNING

**More than 3,000 packing plants** are engaged in preserving the good foods conserved for future use each year in the United States. Fresh foods are canned at the peak of perfection within a few hours of harvesting. To handle them properly the modern packing plant must be efficient and spotlessly clean. Steel machines are used in the receiving, washing, sorting, grading, blanching, peeling and coring of fruits and vegetables. They are also used in filling the containers (see illustration), exhausting the air from them, sealing, processing in steam retorts, cooling, labeling, packing, warehousing and shipping.

**Commercial canning 80 years ago** (see sketch), used crude, heavy cans. These were hand filled and hand closed. When tin plate manufacture was introduced in America by the steel industry, fast, safe packing of foods by machinery quickly developed. Perfection of cold reduced steel strip and improvement of tin coatings gave packing industry new impetus.

**Behind today's food packers** are the container manufacturers, who supply the packer at the right time and in the necessary quantity. They furnish technological advice and guidance, as well as practical information on processing treatments for various products. They also carry on experimental work on new techniques. Their service men are constantly assisting the packer. Can and closure makers must be familiar with the amount of acreage planted, conditions of crops and other variables influencing the demand for containers.

**60 canisters a day** was best output of expert tinsmith in the 1840's, working by hand-and-foot power with iron sheets crudely coated with tin. Today, with modern tin plate a packer's can line produces 400 tin cans a minute, over 3,000 times the output of an early can maker.

**Behind the can and closure makers** is the tin plate industry, of which Jones & Laughlin is a part. J&L supplies the best possible tin plate in a wide variety of grades, coatings and tempers. The steel industry works with the can and closure manufacturers constantly in improving coatings and fabricating qualities of tin plate.

**Tin plate** is made to exacting specifications. The tin coating on the light gage cold reduced steel sheet must be evenly distributed to resist corrosion and provide a good soldering surface. The gage must be uniform in order to pass smoothly through the complicated can-making and closure machines. The temper of the sheet must be exact to form can bodies without fluting or breaking. The sheet must be ductile to "flow" readily in dies for forming and deep drawing operations. The coating must provide good surface for lacquers, enamels and lithography. These qualities are assured in J&L tin plate, by the Jones & Laughlin Controlled Quality method of manufacture.

# Double Action CLEANING MACHINES

By ROBERT MAWSON
Providence, R. I.

CLEANING operations on parts which have been ground and polished utilize many methods and a variety of equipment in the many plants performing this operation. Equipment used in some plants is not only very costly, but results are not always satisfactory because the polishing material is not entirely removed from the parts being cleaned.

Such has been found the case in the plant of a company which manufactures a product built up of a number of steel stampings. These pieces are assembled and the several mating surfaces ground and polished to present a neat finished article. For this polishing operation oil or grease paste is used.

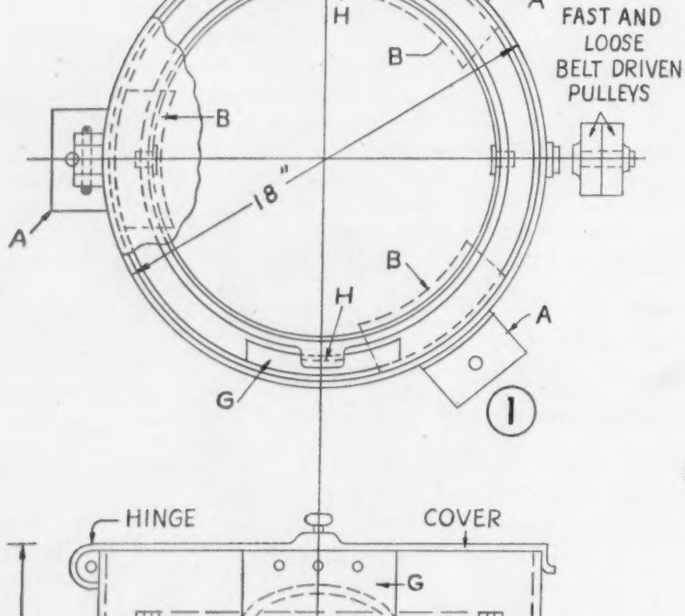
The former method of removing this paste after polishing was to wash parts with kerosene, using cloths for drying. At best this method left a messy appearance, besides being a costly job.

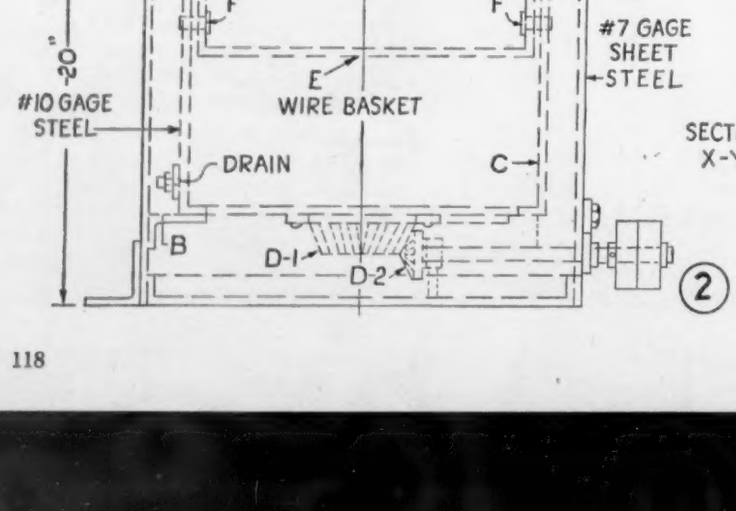
A cleaning machine was then designed and built with an outer circular shell fastened to a table by three brackets, designated as A in Fig. 1. Three reinforcing strips B were attached to the inside of this outer shell or drum and on these strips rests the inner drum C, shown in Fig. 2.

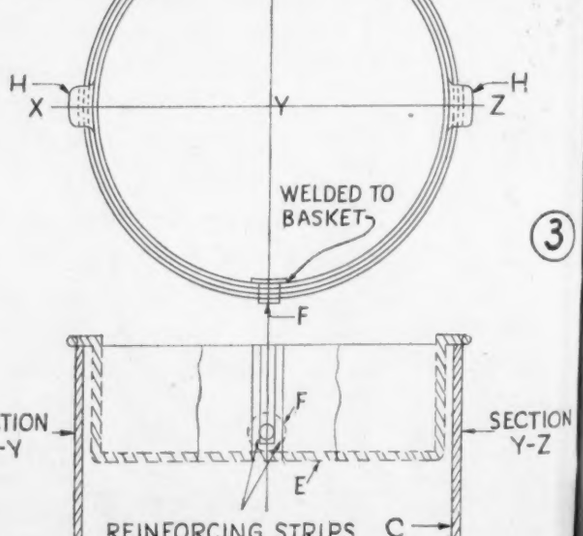
A bevel gear D-1 is fastened to the bottom face of drum C, driven by a smaller bevel gear D-2. The necessary motion is obtained from a belt driving the pulleys shown at right of Figs. 1 and 2. The motion transferred to this belt is from an overhead shaft. The machine was provided with a fast and loose pulley as shown. The belt operating on the fast pulley revolves drum C which revolves on the angles B.

Inside drum C another circular drum

(*Please turn to Page* 151)



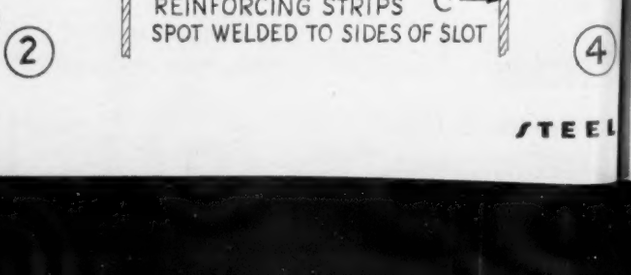




*Fig. 1 — Diagram, looking down on parts cleaner, showing layout of inner and outer drums and wire basket*

*Fig. 2—Elevated diagram showing bevel gear driving arrangement. Gears D-1 and D-2 drive drum C and basket E, cam G raising and lowering basket to clean parts*

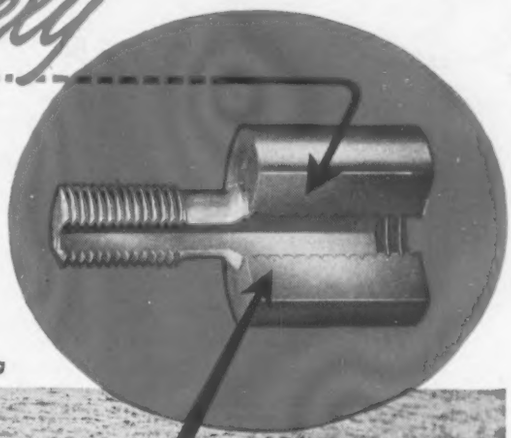
*Fig. 3—Projections H on basket cause raising and lowering when passing over cams. Pins F slide in slots in inner drum*

*Fig. 4—Arrangement of basket in inner drum C*

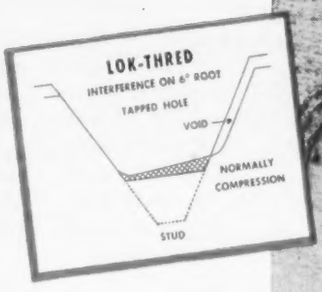
# THIS STUD *locks securely*

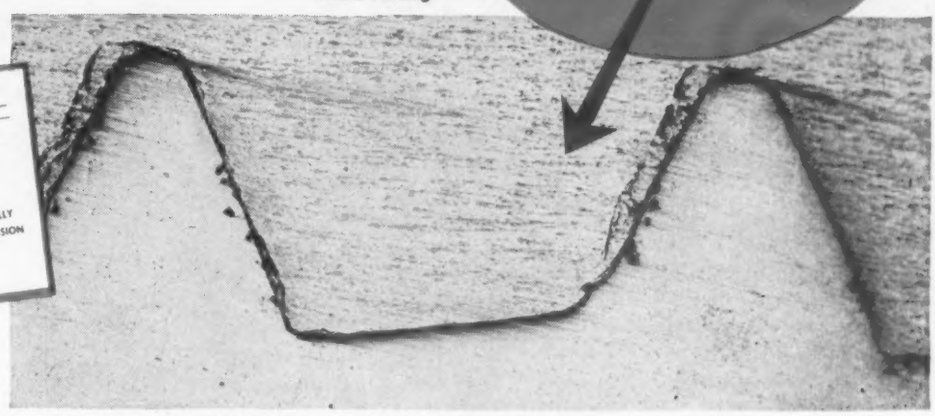
# IT'S THE NEW LOK-THRED

# MADE BY "NATIONAL"

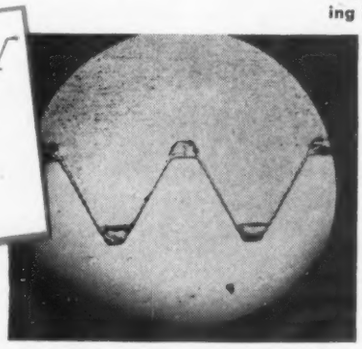


*Patent Pending*



**Photomicrograph of thread section in place in aluminum, showing how 6° root angle in Lok-Thred design absorbs the load.**



**Photomicrograph of conventional stud thread (oversize fit in an attempt to lock).**

Here's an entirely new principle of thread design—the LOK-THRED!

In conventional threads, stresses result in shearing or stripping action borne by the thread flanks.

The LOK-THRED design puts the load on the 6° angle at the root of the thread so that stresses are carried by compression transmitted to the surrounding metal.

The LOK-THRED is especially suited to studs for use in aluminum and magnesium as well as cast iron or steel. It solves the designer's age-old headache of studs loosening under vibration or lateral motion.

National
HEADED AND THREADED PRODUCTS

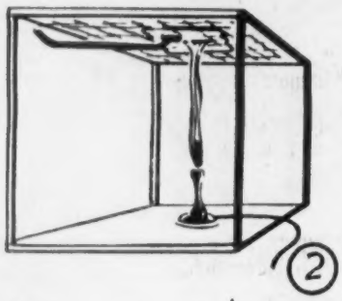
## FACTS ABOUT LOK-THRED

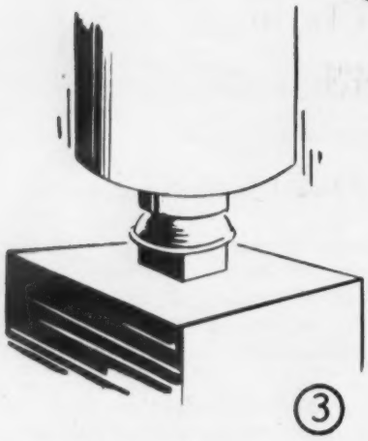
1. A modified American National thread designed to lock securely and become tighter in service.
2. Handled with standard tools.
3. Does not require selective fits.
4. Seals positively and in many cases obviates need for blind tapping and adding bosses.
5. Has much higher fatigue limit than ordinary threads.
6. Does not gall when being driven.
7. Does not fret from lateral motion.
8. Entire normal working load carried on 6° angle at root of thread.
9. Stronger in both tension and torsion than ordinary American National threads.
10. Re-usable and on any re-application one additional quarter turn brings the torque back to its original installation value.

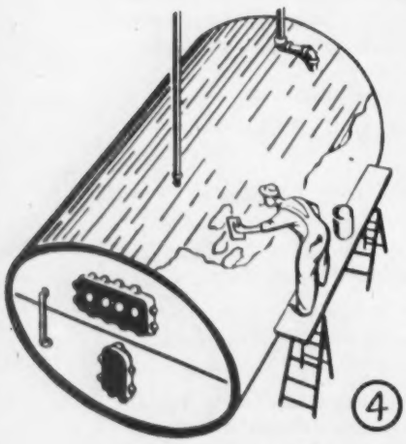
*Write for samples and full information*

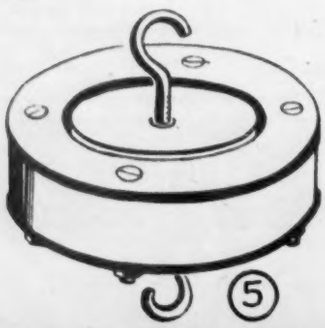
## THE NATIONAL SCREW & MFG. CO., CLEVELAND 4, O.

# New Mineral Wool INSULATION STANDARD









## . . . permits metalworking industry to order on specification basis

LATEST development in joint standardization program of the National Bureau of Standards and the Industrial Mineral Wool Institute is the release of standard CS-131-46 on testing and reporting of all forms of mineral wool insulation, widely used by both steam power plants and manufacturers of electrical heating and refrigeration equipment.

Adhesive strength, corrosion resistance, coverage and temperature resistance, in addition to the basic feature of thermal conductivity, are among tested characteristics of importance to the metalworking industry. Tests described cover all material of fibrous forms processed from molten rock, slag or glass.

Forms of industrial mineral wool for which test methods are given are blanket, block, board, felt, granulated, industrial batt, insulating cement, loose, and pipe insulation of both blanket and molded forms.

Uniform and detailed methods of testing and recording physical and chemical properties are given. The forms of industrial mineral wool are defined and formulas given for fixing the conclusive factor of each test so that standards may be made available for the judgment of characteristics and behavior by uniform tests of any type of industrial mineral wool.

Test for adhesive strength of insulating cement is based on power required to separate two metal elements of prescribed size which have been bound together with a layer of insulating cement. The formula gives a result in pounds per square inch.

The test for compressive strength applies to block, board, and insulating cement, and as in the preceding test, gives a result in pounds per square inch of compressive strength.

Corrosion resistance is tested for all types of industrial mineral wool except insulating cement. It is based on relative effect on identical steel plates — one freely exposed to humidity, and the other protected between specimens of mineral wool material.

The coverage test applies to insulating cement only. The formulas express wet and dry coverage in square feet 1-in. thick per 100 lb of cement, volume change upon drying and dry density.

Density and thickness tests are established for industrial batt, blanket, felt, and blanket-type insulation. By different methods, the same tests are made for block and board insulation and for molded pipe insulation.

Fire-resistance test is made with a large bunsen-type burner on all mineral wool products in order to classify the materials as (1) incombustible, (2) fire-retardant, (3) slow-burning, or (4) combustible.

Moisture adsorption tests are described for all mineral wool products except insulating cement (which is applied wet to

*Fig. 1—Depth gage for measuring thickness*

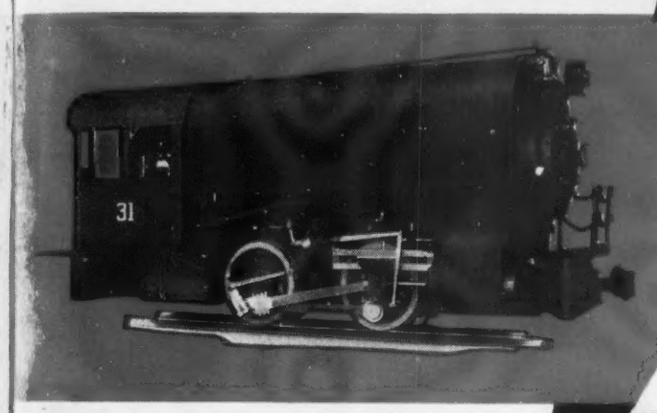
*Fig. 2—Test for fire resistance*

*Fig. 3—Test for compressive strength*

*Fig. 4—Coverage test for insulating cement, important in locomotive lagging or hot-tank insulation*

*Fig. 5—Device for testing adhesive strength*

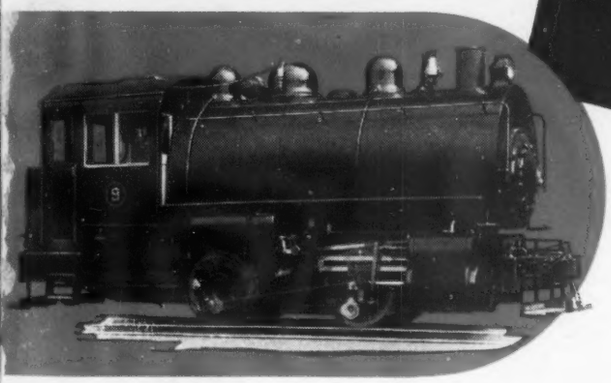
# PORTER Steam Locomotives




## Lower Operating Costs

## Less Maintenance

## Greater Availability




**Here are some of the features that give PORTER Locomotives their EXTRA STAMINA**

1. Extra-heavy frames, flame-cut from solid, heavy-section, Universal mill plate. Annealed and heat-treated after cutting.
2. Axles, crank pins, guides, rods, and other strain-bearing parts solid-forged from best quality open hearth steel.
3. Extra large bearing surfaces on all moving parts.
4. Accurate machining of all wearing and fitted surfaces.
5. Case-hardened pins and bushings at all vital parts.

PORTER "Better Built" Equipment
Established 1866

LOCOMOTIVE DIVISION:
Diesel, Diesel-Electric, Steam and Fireless Steam Locomotives
AMERICAN-FORT PITT SPRING DIV.:
Coil and Elliptic Springs for Locomotives, Freight and Passenger Cars.
PROCESS EQUIPMENT DIVISION:
Complete Line of Chemical, Food, and Petroleum Refinery Equipment.
QUIMBY PUMP DIVISION:
Screw, Rotex, and Centrifugal Pumps.
HINDERLITER TOOL DIVISION:
Oil Well Drilling Equipment.

**H. K. PORTER COMPANY, Inc.**

PITTSBURGH, PA. • BLAIRSVILLE, PA.

NEWARK, N.J. • NEW BRUNSWICK, N.J. • MT. VERNON, ILL.

equipment operated at relatively high temperatures), the results showing as percentage of adsorption by weight and by volume.

Tests for shot content (nonfibrous content) are specified for industrial batt, blanket, felt, granulated, loose, and blanket-type pipe insulation. The formula for determination of the factor expresses shot content as a percentage of weight.

Temperature resistance tests for all mineral wool products are specified. These determine the behavior of the material during, and the appearance after, protracted exposure to any specified temperatures.

Four procedures are included for determining the factor of thermal conductivity. Three alternate methods for blanket-type and molded-pipe insulation, and one test for all other industrial mineral wool products, are described. For pipe insulation there is the choice between methods using guarded ends, calculated end losses, and calibrated end losses, and for other materials the method of the guarded hot plate. The formula in each case gives the thermal conductivity (in Btu's per hour per square foot per degree Fahrenheit and per inch thickness) for the mean temperature of the test.

**Tests Based on Adopted Methods**

Several of the tests established are based on methods adopted as standard by the American Society for Testing Materials. Others were worked out by the specifications committee of the Industrial Mineral Wool Institute.

This standard was promulgated in May 1944. Members of the Institute have now accepted and approved the standard CS-131-46, the subject of this article. It was issued by the National Bureau of Standards of the Department of Commerce in June of this year and contained names of scores of acceptors throughout the mineral wool industry. Copies of the standard are available for distribution and can be secured from the Industrial Mineral Wool Institute, 441 Lexington Avenue, New York 17.

—o—

Division of Labor Standards of U. S. Department of Labor is offering a series of industrial safety charts which depict work hazards and dangerous work practices. It is making available a new group of charts each month—each group being on a different subject. Charts may be obtained from the Superintendent of Documents, Washington, at a cost of 5 cents each or $3.75 per 100 copies.

# Zinc Coating

## STRUCTURAL MEMBERS

METAL surfaces are protceted from salt water corrosion for periods up to 12 years by a process utilizing a spray-applied zinc coating which is in excess of one ten-thousandth of an inch thick. Developed by Glaspray Process Co. of San Francisco, the process was recently demonstrated by applying such a coating to the structural members of the famed Golden Gate bridge after their surfaces had been grit-blasted to remove all paint and rust.

The zinc used is in powdered form, but upon application it is mixed with gas and forced by means of a specially designed spray gun (illustrated) through a flame of approximately 786°F. The flame preheats the steel base so that the zinc coating fuses itself with the steel and becomes inseparably bonded to the structural member itself.

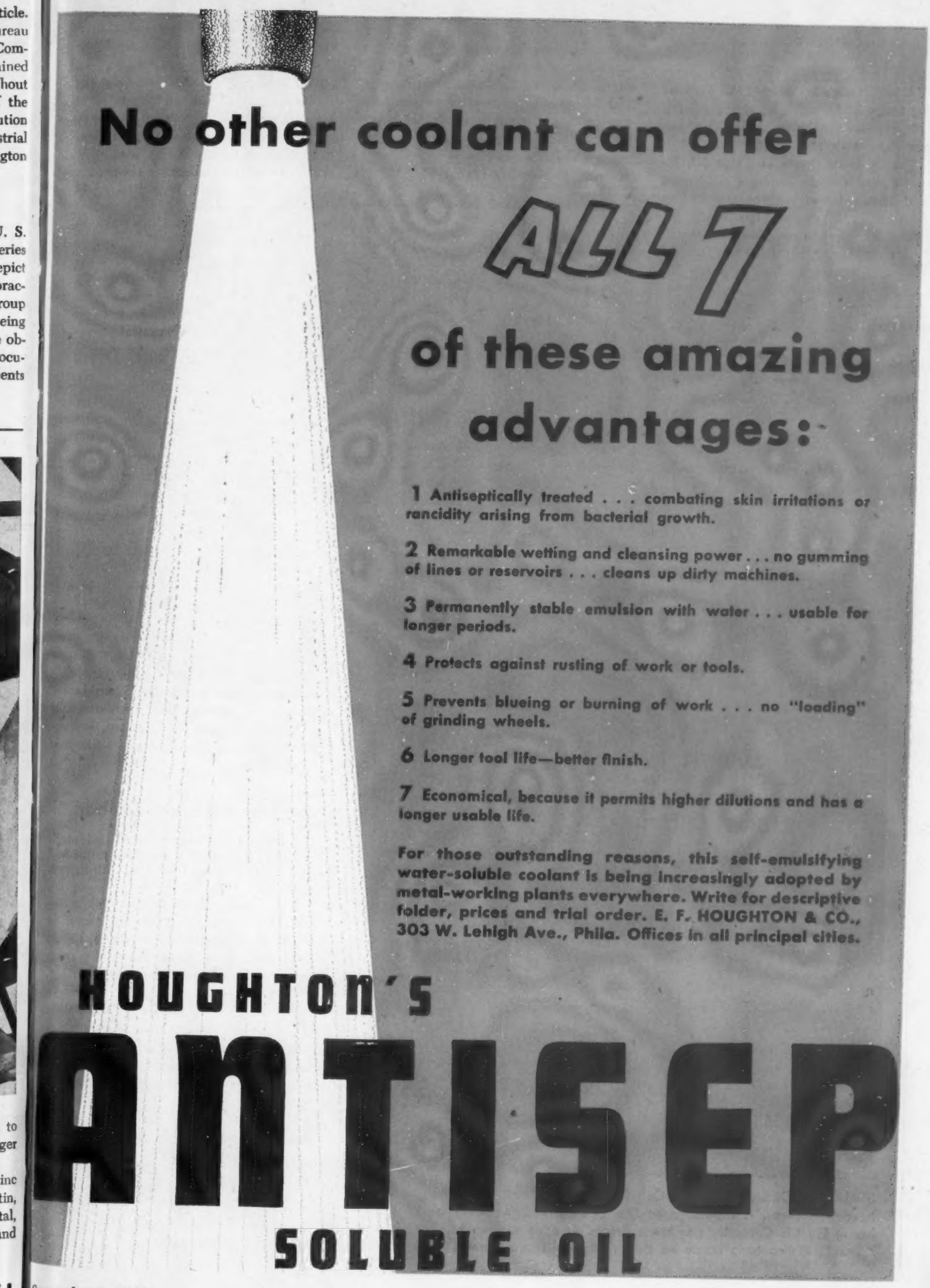
The corrosion resistant coating was used extensively during World War II for the protection of ship's tanks. More than half a million square feet were coated in this particular operation, its first application.

The process is portable and is moved easily from job to job. Its principle equipment is the air compressing machinery. In the coating of tanks of naval vessels, the compressors were located in pairs on docks alongside the ships and the necessary grit and grit recovery tanks were located on the decks of the ships themselves, with hoses leading down into the tanks.

It was found in the development of the process that some new techniques had to be perfected and the application had to be handled by trained personnel. A special mask, seen in accompanying photograph, was designed and engineered to protect the operator's face, supplying him with pure air in a manner similar to the method used in deep sea diving. A suction hose is used to recover a large part of the grit to keep confined areas relatively clean.

The Glaspray company claims that use of the process results in a finer surface finish, permits inexpensive materials to do the work of more expensive materials and eliminates danger of rust and corrosion for greater periods of time.

While the Golden Gate bridge demonstration used a zinc coating, the process also is designed for coating with lead, tin, aluminum, brass, bronze, copper, manganese, monel metal, silicon, nickel, iron and chromium, as well as with glass and plastics.


No other coolant can offer
ALL 7
of these amazing advantages:
1 Antiseptically treated . . . combating skin irritations or rancidity arising from bacterial growth.
2 Remarkable wetting and cleansing power . . . no gumming of lines or reservoirs . . . cleans up dirty machines.
3 Permanently stable emulsion with water . . . usable for longer periods.
4 Protects against rusting of work or tools.
5 Prevents blueing or burning of work . . . no "loading" of grinding wheels.
6 Longer tool life—better finish.
7 Economical, because it permits higher dilutions and has a longer usable life.
For those outstanding reasons, this self-emulsifying water-soluble coolant is being increasingly adopted by metal-working plants everywhere. Write for descriptive folder, prices and trial order. E. F. HOUGHTON & CO., 303 W. Lehigh Ave., Phila. Offices in all principal cities.
HOUGHTON'S
ANTISEP
SOLUBLE OIL

## Fine-Grained Steels

(*Concluded from Page 98*)

additions cause a lowering of the coarsening temperature, much higher coarsening temperatures can be reached with titanium than with aluminum.

Tensile tests, shown in Table III, indicate that titanium increases yield point and tensile strength with little change in ductility. Titanium has much less effect than aluminum on notched impact resistance, see Table IV. A slight decrease in the temperature of brittle failure and a modest improvement in room-temperature resistance resulted from small additions. This is probably a grain-refining effect, as there is little improvement until the coarsening temperature is raised above the normalizing temperature. Although large additions produced a fine grain-size, they were found to be detrimental to notched impact resistance.

Mixtures of ferrosilicon zirconium and ferrosilicon were added to a series of ingots of low-silicon heat for the zirconium grain-refinement study. The coarsening-temperature tests showed that zirconium is less effective than either aluminum or titanium as a grain refiner. The increase in coarsening temperature was not large, but it was continuous up to 0.13 per cent. It was found to cause a slight increase in yield point and decrease in ductility (Table V).

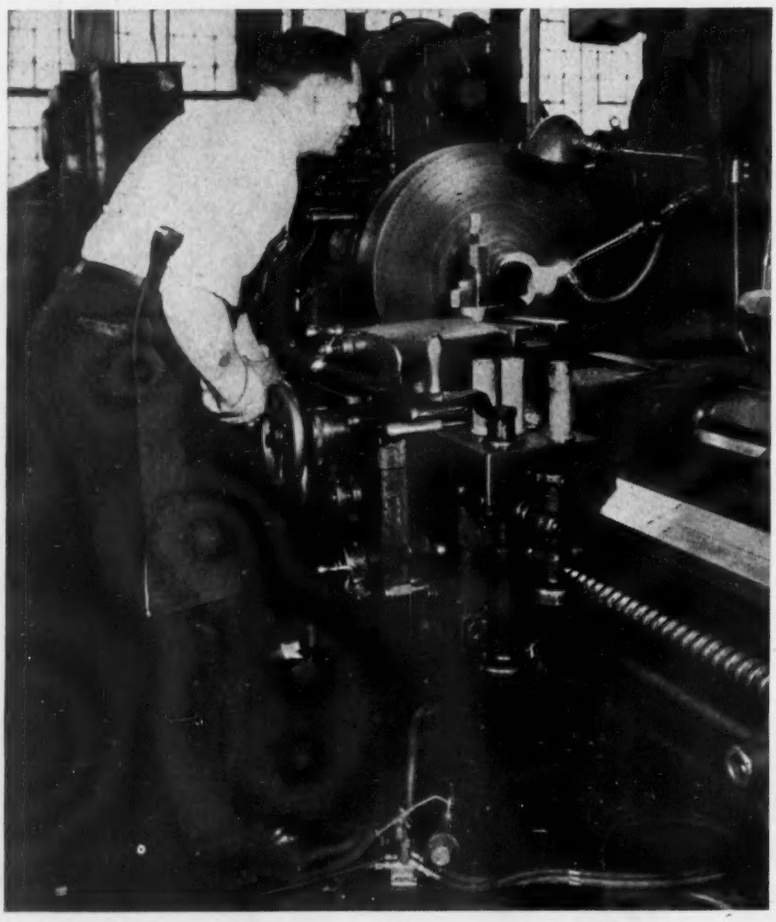
**Effect On Notched Impact Resistance**

Zirconium had a greater effect on notched impact resistance: Temperature of brittle failure was reduced substantially by small additions, and the room-temperature resistance was increased (Table VI). This, however, was attributed to an alloying rather than a grain-refining effect because the improvement in notched impact resistance was evident before the coarsening temperature was raised to the normalizing temperature.

Effect of titanium and aluminum used together was indicated in an aluminum series made from a heat in which enough ferrocarbon titanium was added to the ladle to give a residual titanium content of 0.005 per cent. This heat was practically identical in composition and physical properties with the heat described for the first aluminum series. The higher titanium resulted in an appreciable increase in coarsening temperature. This is shown in Fig. 2 in which the mean of the coarsening temperature after 4 hours heating is plotted against the aluminum content.

It was concluded that the three elements differ in type as well as in degree of grain-inhibiting tendency. Aluminum is most effective as a grain-growth inhibitor when 0.028 per cent, as acid soluble aluminum, is present. It is difficult to reconcile this critical amount with any theory involving grain-growth inhibiting by an aluminum oxide. The simple relation between titanium content and coarsening temperature indicates that the mechanism of grain-growth inhibiting by titanium is much less complex than that of aluminum. This relationship is perfectly compatible with, though not a proof of, grain-growth inhibiting by titanium carbide. Zirconium is less effective than either aluminum or titanium as a grain refiner.

Improvement in notched impact resistance at low temperatures by use of these elements is more of a direct alloying effect than the result of grain refinement. Grain refinement does improve the notched impact resistance and it is therefore difficult to distinguish alloy and grain-refining effects. Considering the alloying effects alone, aluminum and zirconium are beneficial to low temperature impact resistance whereas titanium is detrimental.



**SIMULTANEOUS ANNEALING: During spinning operation, work-hardened metal is annealed at the East Pittsburgh works of Westinghouse Electric Corp. by gas torch arranged near the work. Foot pedal controls flame so that the part is not burned**

## Text on Industrial Carbon

***Industrial Carbon***, by C. L. Mantell; cloth, 472 pages, 6 x 9 inches; published by D. Van Nostrand Co. Inc., 250 Fourth Ave., New York, for $7.50.

The second edition of this work, completely rewritten to cover advances in the 17 years since the first edition, brings the subject up to date. The first portion covers the elemental forms of carbon, with their applications. The adsorptive forms, which have increased enormously, constitute the second section. Manufactured forms, artificial graphite, electrodes, brushes and similar forms are treated in the third part. In the fourth section are gathered analytical and testing methods applied to all forms of carbon and properties which vary widely as a function of shape, particle size and manufacturing technique.

Literature of carbon is widely scattered and the author in this work has attempted to cover the technologic applications of elemental carbon aside from its use for fuel.

**ABOVE:** Meehanite main sprocket used in propulsion assembly.

**RIGHT:** Twin Disc Model ME-300 multiple engine single screw unit in which Meehanite sprockets are specified.

When designing their Model ME-300 multiple engine hydraulic drive unit for single screw marine propulsion, Twin Disc Clutch Co., Racine, Wisconsin, specified Meehanite sprockets for the roller chain drives. The importance of these sprockets from the standpoint of performance, resistance to wear, strength and toughness, is obvious in units of this type. Meehanite meets the requirements.

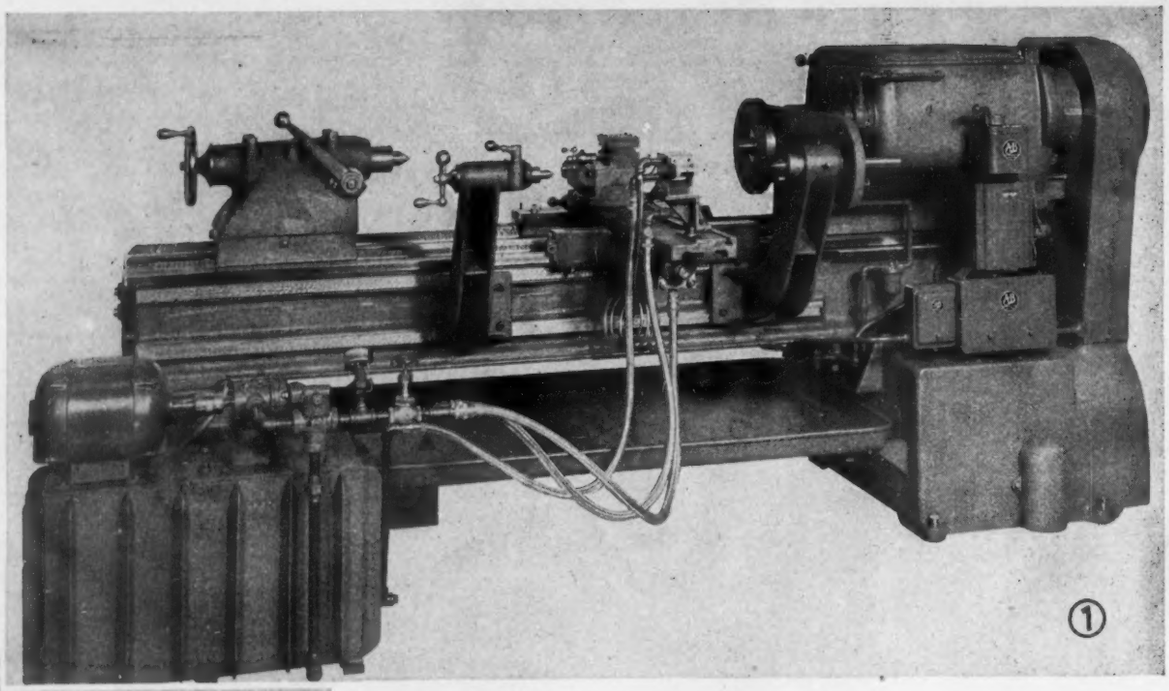
All sprockets have cut teeth and the machining of a part of this type provides tangible evidence of casting uniformity, solidity, freedom from defects and good machinability.

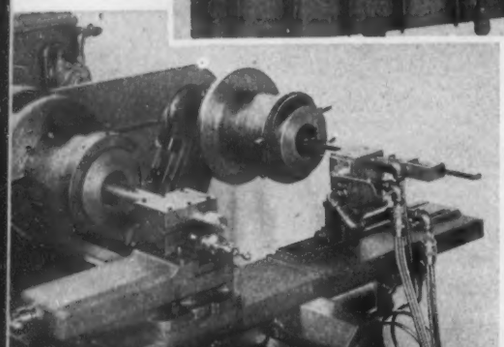
Write for Bulletin No. 20 entitled "Meehanite—the Metal for Wear Resisting Castings."

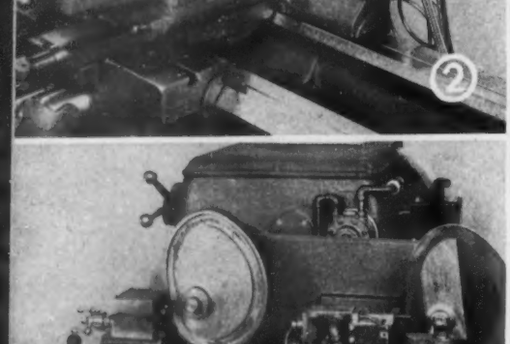
*New* 16 mm motion picture "Meehanite Means Better Castings" just released. We will be glad to lend you a print.

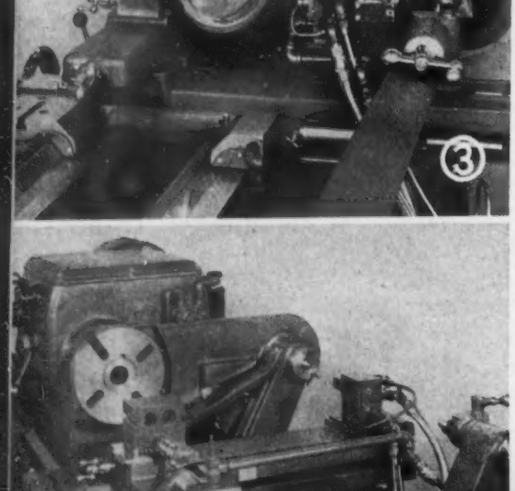
**MEEHANITE**

PERSHING SQUARE BUILDING, NEW ROCHELLE N.Y.









# Duplicating Complicated Forms with a PROFILING MACHINE

***Lathe attachment uses any type of template to reproduce any job from bottle molds to complicated cam forms***

A HYDRAULIC profiling and duplicating machine capable of reproducing any job from bottle molds to complicated cam forms has been developed by Springfield Machine Tool Co., Springfield, O. Shown attached to a 20 in. medium duty lathe on an 8 ft bed, Fig. 1, it will make either interior or exterior duplications.

Any type template may be used with the machine—a round type rotated between centers at rear of machine, a flat template held stationary between centers, or a formed flat template mounted directly on either one of two brackets, which are adjustable on machined and hand-scraped ways on rear of lathe bed. Templates requiring rotation are driven by an adjustable chain drive directly off spindle, mechanism of which is guarded by a metal guard.

Three levers on front of headstock provide twelve spindle speeds. A 2-speed motor will further reduce speeds to as low as 5 to 6 rpm, when required.

Most of the duplicating mechanism is on the cross slide which is designed to overhang rear of bed enough to mount stylus control valve on top of slide. Valve swivels to accommodate various contours

(*Please turn to Page* 150)

*Fig. 1—Rear view of lathe with profiling machine attached, showing adjustable brackets attached on machined ways on rear of lathe. At extreme left is hydraulic pump unit*

*Fig. 2—Close-up of profile machine showing stylus following contour of bottle mold in background and duplicate mold being cut in the foreground parallel to machine spindle*

*Fig. 3—Contour cam turning using a revolving flat thin sheet metal template*

*Fig. 4—Duplicating mechanism arranged to work at right angles to spindle. Note hydraulic cylinder parallel to lathe bed*

# Hot-Dip Galvanizing Practice

WILLIAM H. SPOWERS JR.
*President*
Spowers Research Laboratories Inc.
New York

### A Permanent Galvanizing Kettle

EVER since the beginning of galvanizing the zinc container has been made of steel. Attempts were made to use cast iron for small installations but the results were unsatisfactory. Cast iron was found to be too soft and dissolved into the molten zinc too rapidly with a resulting high dross loss.

For many years the reverse flange type of kettle was the standard method of fabrication. This method of construction, however, was difficult and required flanging machines of tremendous power. Reference to Fig. 14 shows a standard reverse-flanged kettle with the bottom and ends of one piece and flanged outwardly. The rivet holes are drilled rather than punched through the flanges. In this construction the bottom and end plate is made of 1-in. flange steel.

The design of this kettle was based on the theory that inasmuch as no heat was applied to the bottom or ends little deterioration was evidenced there. This was correct, for in many reverse flange-type kettles as many as three or more pairs of side plates were used on one bottom and end plate. The possibility of this procedure was due to the fact that heat was forced through the side plates and none through the bottom and ends.

Inasmuch as the flanges are formed outward for the reception of the side plates, none of the rivets come in contact with the molten zinc. These side plates usually are made of highgrade firebox steel because of the denseness of the material and its ability to better withstand the attack of the molten zinc.

Kettles of this type up to 42 ft long have been installed and have given excellent service under continuous operation for many years.

Many attempts were made to use welded kettles but not with any success until the advent of the coated welding rod. Development of the coated welding rod brought into general use the welded galvanizing kettle shown in Fig. 13. Its serviceability has been recognized for some years and it is now accepted universally. The side plates of these kettles through which the heat is forced are usually made of 1¼-in. stock although many are built as thick as 2 in.

Deterioration of galvanizing kettles is caused by the dissolving away of the inner surface of the side plates; little or no erosion occurs on the outer surface of the plate. This is due to the fact that steel is electropositive to zinc and when heat is placed on one side of a steel plate and molten zinc on the other the steel slowly but surely goes into solution in the zinc. By the same token the dissolved steel forms large quantities of dross.

The use of a steel container or molten zinc is fundamentally wrong. During the refining process considerable care is exercised to eliminate all possibility of iron or steel coming in contact with the ore or the zinc. And yet the wire galvanizer who pays a premium for high-grade zinc melts this costly material in a steel container where it becomes

*Fig. 13 (right) — Welded galvanizing kettle, 25 x 4 x 4 ft. Bottom and sides are formed of one plate of 1¼-in. special firebox steel. Steel angles, 4 x 4 x ¾-in., are riveted to the sides and ends at the top with rivets countersunk and driven flat on inside of kettle*

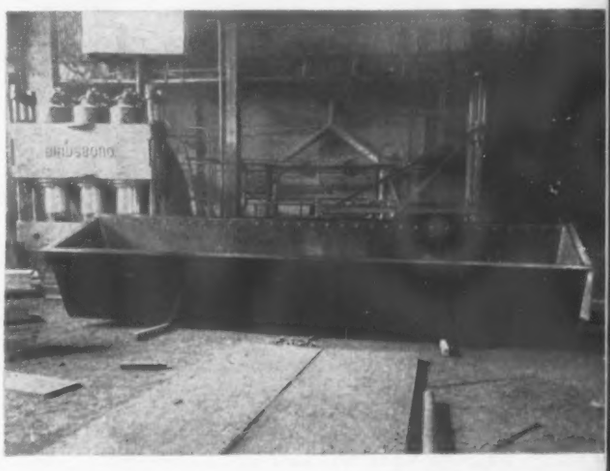
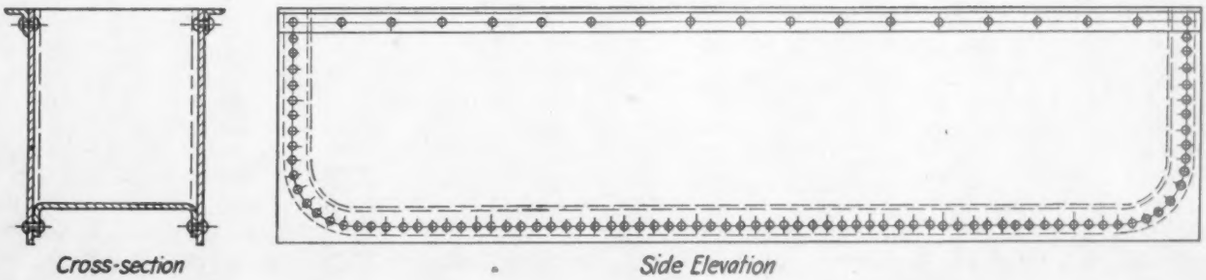


*Fig. 14 (below) — Standard reverse-flanged galvanizing kettle with the bottom and ends made of one piece and flanged outwardly*



*Cross-section* *Side Elevation*

contaminated with iron and forms dross.

Furthermore, the use of steel kettles has greatly restricted the temperature range at which the equipment may be operated. Deterioration charts of galvanizing kettles show a slow rise up to approximately 880° F. At this point the chart line goes abruptly upward and at 900° F is practically vertical; any continued operation above 890° F will result in rapid failure of the kettle.

In many cases, telephone wire for instance, the ability to maintain a zinc temperature of 900 to 1000° F would be of inestimable value, but even with the latest type of furnace design the use of steel in the kettle prevents the possibility of any such operating temperatures.

Many costly experiments have been conducted in an effort to find a satisfactory material for galvanizing kettles. Various settings were tried with many types of refractories. Finally it was found that one special grade of borosilicate when fused to the inside of the kettle would stand the attack of the molten zinc under indefinite operating conditions.

Laboratory cups were made from steel and this lining was fused on the inner surface. These cups were filled with zinc and held molten at 900° F all day and frozen at night (something that is never done in actual practice) for almost a year with absolutely no deterioration in the lining or the steel cups. Furthermore, *no dross was formed.*

The success of this material was so apparent that a semicommercial kettle was then built 4 ft long, 18 in. wide and 18 in. deep. This was filled with zinc and maintained for months at a time at 1000° F and over, with complete success. The first commercial installation made is shown in Figs. 15 and 16.

Another remarkable feature of this lining material is its toughness and pliability. A kettle of this type 24 ft long, 45 in. wide and 40 in. deep recently was installed in a large wire plant and is operating on special grades of wire at temperatures ranging from 900 to 1000° F.

*(To be continued)*

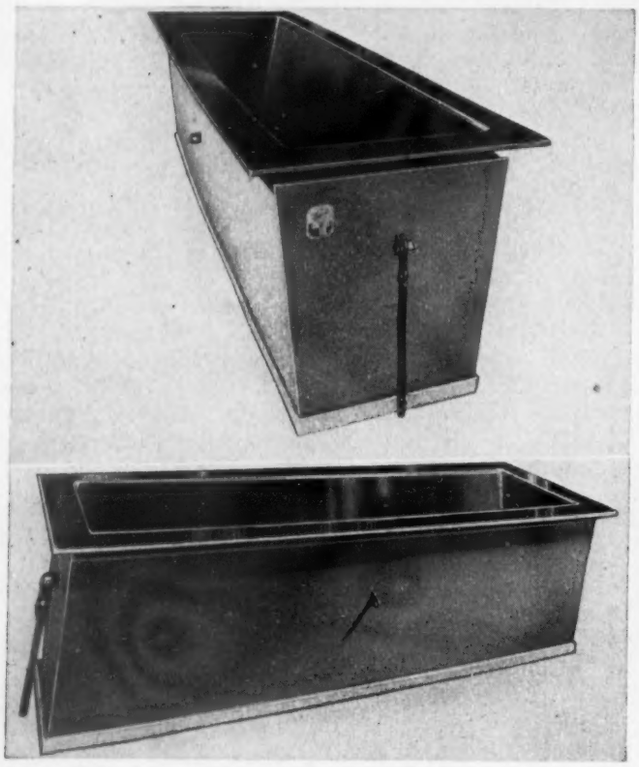
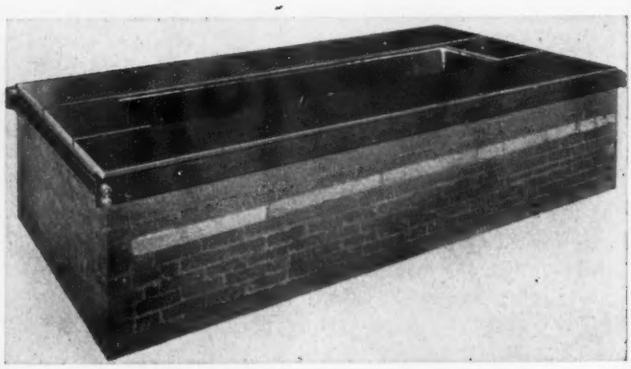


*Fig.* 15 *(left)—End and side views of modern galvanizing kettle which is lined with a fused-in vitreous coating thoroughly resistant to molten zinc*

*Fig.* 16 *(below)—Modern gas-fired galvanizing kettle built with a permanent fused-in lining*



## Accurate Screw Machine Cams Made from Meehanite

Instrument Parts Corp., Ossining, N. Y., manufacturers of tiny, fully machined precision parts for such instruments as watches, found that the cams on its screw machines—the "brains" of the machine—function best when made of Meehanite. An investigation proved them to give increased service life and maintain accuracy, the company stated.

The cams used rotated on a shaft of a screw machine. Thus, any inaccuracy, even as small as 0.001-in., would show up in the finished product.

Tests conducted by the company showed that heat treated and hardened Meehanite cams lasted 200 hours in one operation. A nonhardened cam lasted 60 hours, while a cam of conventional material lasted for the short period of 30 hours.

## Heat Treating Principles Discussed in New Booklet

Presentation of the fundamentals of heat treatment, prepared by the Research and Technology department, Carnegie-Illinois Steel Corp., subsidiary of United States Steel Corp., Pittsburgh, is of interest to younger metallurgists and to heat treaters, production engineers and designers.

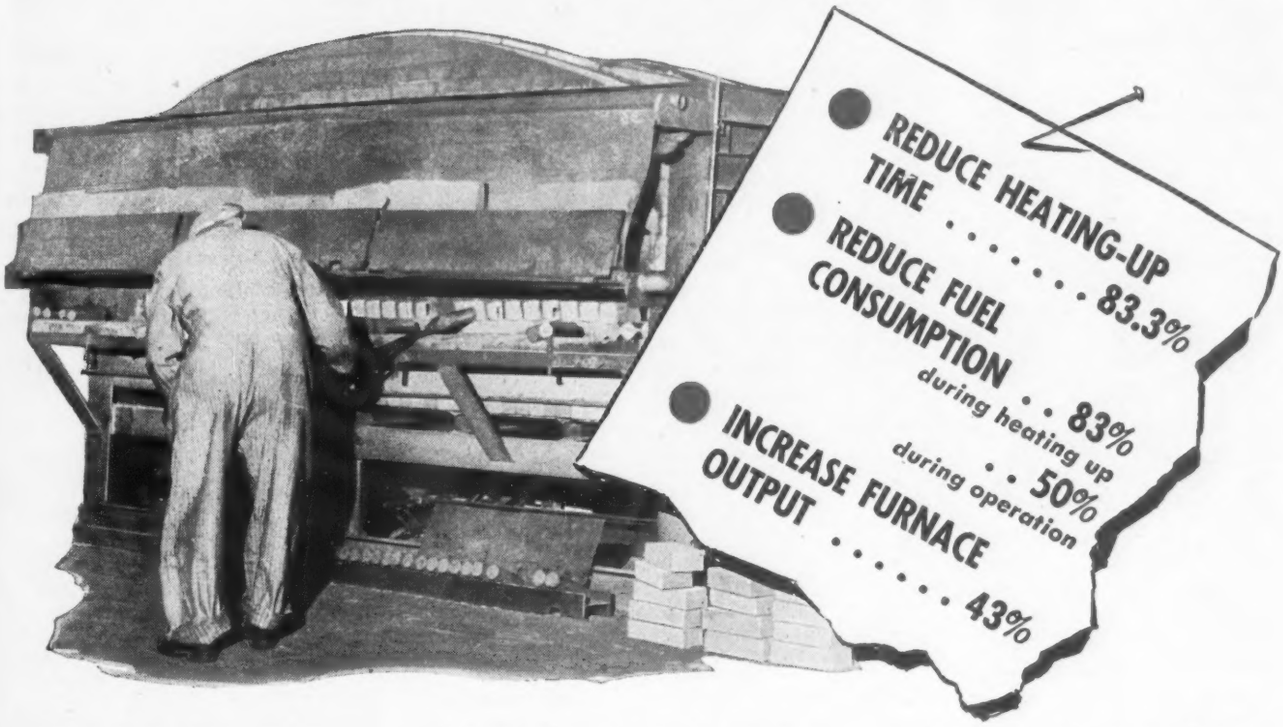
Entitled "Suiting the Heat Treatment to the Job", this 2-color, 8½ x 11-in. wire-bound 54 page booklet, illustrated with charts, diagrams and photographs, devotes 26 pages to factors concerning hardness, including heating, pearlite, bainite, martensite S-curves, hardenability and quenching.

Next 26 pages relate to toughness, covering such factors as tempering, shape of piece, notch-bar, austempering, stresses and cracking. Six fundamental statements summarize detailed explanations. Table of Jominy end quench distances versus bar diameters for six different quench conditions concludes this heat treating booklet.

Copies are available from any office of U. S. Steel or its subsidiaries.

# Comparative Forge Furnace Tests Prove that

# B&W INSULATING FIREBRICK . . .


REDUCE HEATING-UP TIME . . . . . 83.3%
REDUCE FUEL CONSUMPTION
during heating up . . 83%
during operation . . 50%
INCREASE FURNACE OUTPUT . . . . . 43%

River Valley Forge Company, one of the leading forging plants in the country, ran comparative tests to determine the most efficient, economical refractory for its forge furnaces.

Two identical furnaces were used—one lined with standard heavy duty firebrick, and the other with B&W Insulating Firebrick. Superior operating efficiency of B&W I.F.B. was proved by these outstanding results:

| | STANDARD FIREBRICK | B&W INSULATING FIREBRICK |
|---|---|---|
| Furnace Output | 70 pieces per hr. | 100 pieces per hr. |
| Heating-Up Time | 3½ hours | 35 minutes |
| Cycle Time | 50 minutes | 30 minutes |
| Fuel Consumption During Heating-up | | reduced 83% |
| Fuel Consumption During Operation | | reduced 50% |

As a result of these tests, River Valley Forge Company lined all of its furnaces with B&W Insulating Firebrick, thereby increasing the capacity of all forging units—reducing production costs—insuring more uniform forgings through better control.

This case history is typical of the advantages to be obtained from B&W Refractories in every type of industrial furnace. Your local B&W Refractories Engineer will gladly explain how a complete installation of B&W Refractories can increase over-all operating efficiency in *your* plant. Call on him at any time.

B&W

Water-Tube Boilers, for Stationary Power Plants, for Marine Service . . . Water-Cooled Furnaces . . . Superheaters . . . Economizers . . . Air Heaters . . . Pulverized-Coal Equipment . . . Chain-Grate Stokers . . . Oil, Gas and Multifuel Burners . . . Seamless and Welded Tubes and Pipe . . . Refractories . . . Process Equipment.

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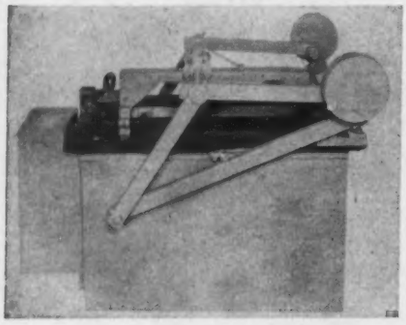
R-233

# Industrial Equipment

## Barrel Plater

Lasalco Inc., St. Louis, is introducing a barrel plater in which loading and unloading are facilitated by a counterbalancing arrangement that automatically places cylinder in correct position, making loading trays unnecessary.

Other features are a switch type negative contact which is made automatically



when cylinder is loaded into tank and an insulated negative connection through hollow hub of cylinder which prevents interference while loading or unloading. Plater is arranged for three speeds, has a ⅓-hp motor, a 10 x 18 in. hard rubber cylinder with an 8 qt or 30 lb capacity. It is offered with steel tank for cyanide solutions or rubber-lined tank for nickel solutions.

*Steel* 9/2/46; *Item No.* 9530

## Milling Machine

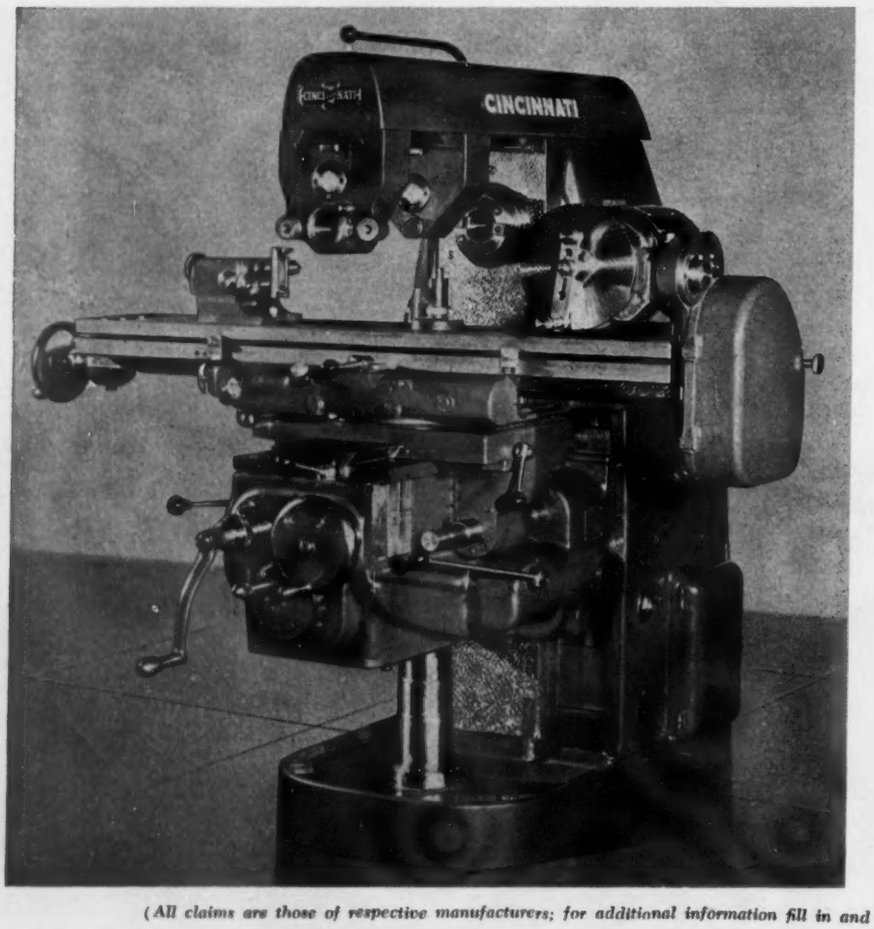
Cincinnati Milling Machine Co., Cincinnati, is announcing universal and plain knee-type horizontal spindle milling machines with exceptionally wide speed and feed ratios designed to cover the latest requirements for all types of milling operations encountered in metal-working industries. Machines feature 16 spindle speeds ranging from 25 to 1500 rpm and a crank-operated hydraulic selector valve is employed to shift gears hydraulically.

A mechanical spindle reverse exerts no effect upon the direction of feeds. Feed rates can be varied from ¼ to 30 ipm. Spindle runs on three bearings, ball and roller. Extra metal on bull gear produces flywheel effect which is of great importance with carbide tooling. Main drive clutch is a single disk dry-plate unit.

Vertical feed screw has its own lubricating system. Parts within column are automatically lubricated and table ways and saddle parts are lubricated by a manual pressure system. Coolant system is completely enclosed in the columns of machines.

Feed controls are independent of each other, and each feed lever has a forward, neutral and reverse position. Cross and vertical hand cranks are automatically disengaged when their respective power feed lever is engaged.

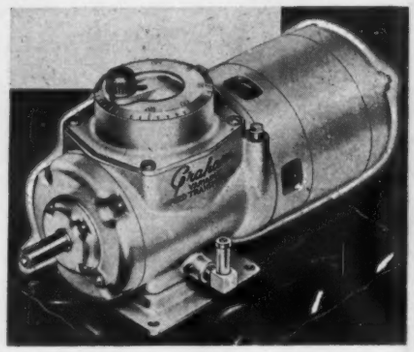
*Steel* 9/2/46; *Item No.* 9740




## Variable Speed Drive

Graham Transmissions Inc., 3754 North Holton street, Milwaukee 12, announces two new variable speed drive models which are compact and light in weight.

One of these, model 15, is for motors up to ⅛-hp. The other, model 40, is for

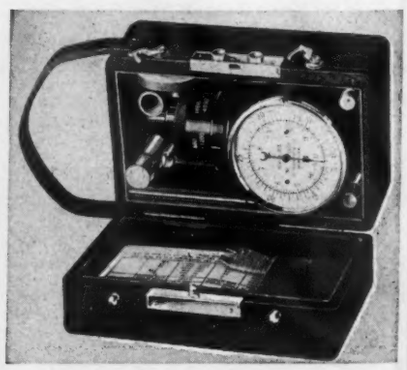


motors from ¼ to ¾-hp. Both units may be had with or without built-in motor, and with built-in parallel spur or right angle worm gearing in a wide variety of controls.

*Steel* 9/2/46; *Item No.* 9505

## Tachometer

O. Zernickow Co., 15 Park Row, New York 7, announces a line of hand tachometers capable of registering from 30 to 48,000 rpm. Made in three models,



each of which covers a different speed range, they are accurate to one-half of one per cent.

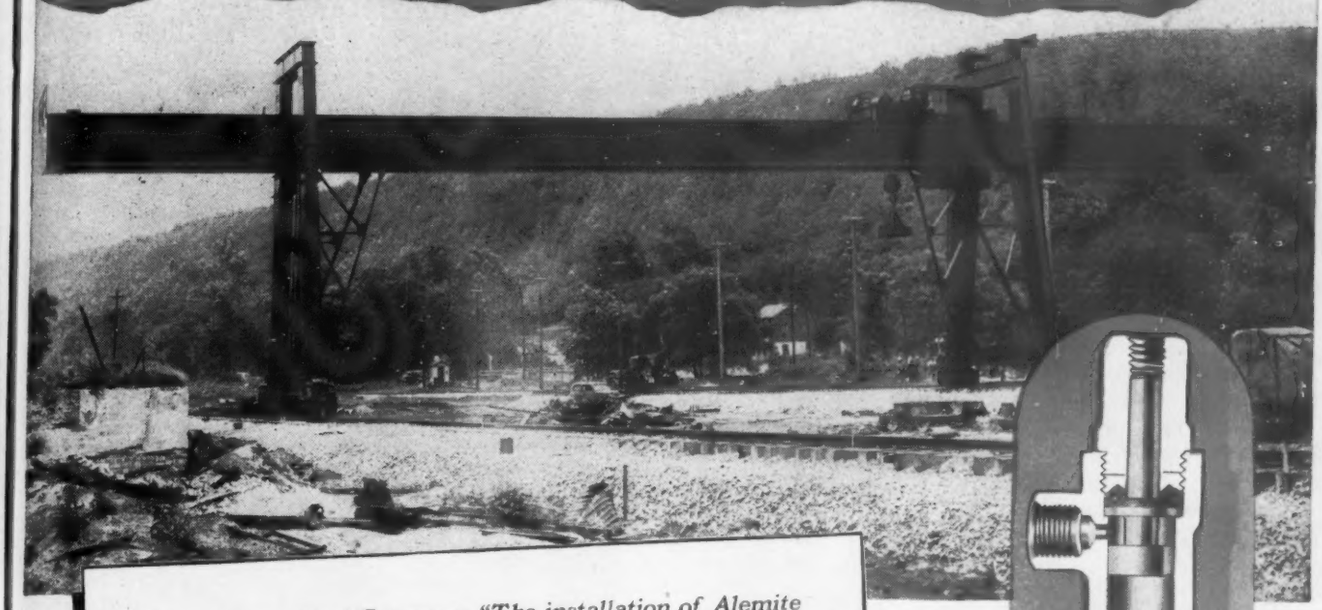
Instruments are unaffected by elec-

*(All claims are those of respective manufacturers; for additional information fill in and return the coupon on page 132.)*

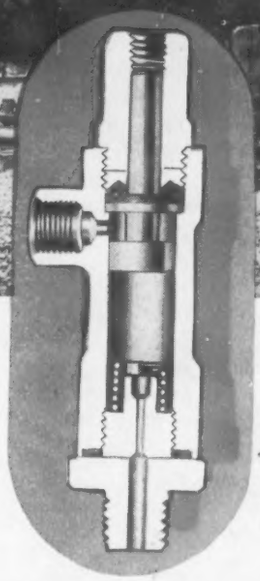
# AT LUKENS STEEL COMPANY

## 84 Overhead Cranes Equipped with

# ALEMITE LUBROMETER CENTRALIZED LUBRICATION SYSTEMS



*Says Lukens Steel Company, "The installation of Alemite LubroMeter Systems on 84 overhead cranes eliminated human error, increased the safety of oilers and reduced lubrication time from 1½ hours to 10 minutes per crane."*



**Alemite LubroMeter Feeder Valve**

Fully hydraulic • Only 2 moving parts • Indicator on each valve • Lubricant delivery easily adjustable • Valve is of heavy duty construction with hardened steel piston. Available in a variety of sizes and types.

**The Alemite LubroMeter System is a single line terminating system with the valves mounted directly in the bearings. It handles grease or oil and is extremely economical in initial cost, installation and operation.**

It is adaptable to practically every type of light and heavy machine used in the steel industry. Cranes, straighteners, tables, shears, blast furnaces, blooming mills, structural mills, rolling mills, levelers, etc. And the LubroMeter System can be installed for manual or automatic operation on present equipment, or built into new machines as original equipment.

**There Are 4 Alemite Systems**

. . . the LubroMeter and 3 other types. Have an Alemite Lubrication Specialist demonstrate one or all four Systems right at your desk with transparent working models. Call the Alemite Distributor nearest you, or write Alemite, 1879 Diversey Parkway, Chicago 14, Illinois.

ALEMITE MELPS THE WORLD GO ROUND

Another Product of STEWART WARNER

# ALEMITE

REG. U.S. PAT. OFF.

*Alemite ALONE Combines all 3 in Lubrication*

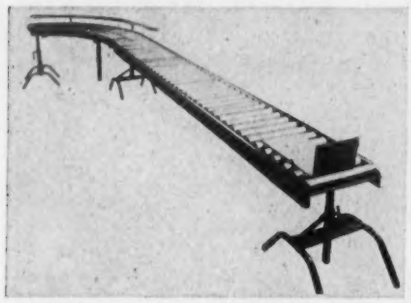
**1. EQUIPMENT 2. PROCEDURES 3. LUBRICANTS**

tricity, magnetism, temperature changes, or moisture and can be used in any position. They indicate right or left revolutions per minute, surface speeds in feet per minute, speed variations occurring during a fraction of a revolution and belt slipping.

*Steel* 9/2/46; *Item No.* 9500

## Gravity Conveyor

Manufacture of the Rapid-Roller conveyor is announced by Rapids-Standard Co. Inc., Grand Rapids, Mich. It handles



various types of irregular surfaced material such as kegs, cartons, crates, boxes, steel bars or long and narrow pieces of light lumber swifty and easilly.

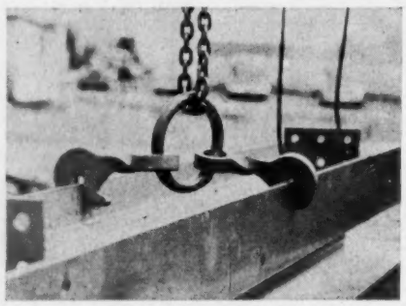
Two standard frame lengths of 5 and 10 ft in two standard widths of 12 and 18 in. are offered. Formed of 16-gage steel, rollers are 2 in. in diameter, projecting ⅜-in. above the conveyor frame level, and are mounted on radial ball bearings at each end. Rollers are spaced at 3 in. intervals, but sections can be obtained in spacings of 6, 9 or 12 in. or any other multiple of the number three.

Conveyor capacity is 80 to 100 lb per foot of distributed load or 800 to 1000 lb distributed load per 10 ft section. Free movement of materials on turns is made possible with double lane curves (in the 18 in. width).

*Steel* 9/2/46; *Item No.* 9513

## Torque Hook

The Diamond torque hook, for lifting such structural steel shapes as beams, girders and channels, is a product of Elizabeth Iron Works, Green Lane, Elizabeth, N. J. This one-operational lifting device, applies principle of torque-action—as load becomes greater so does grip of hook.



Style 6-20 will lift beams 6 to 20 in. wide, channels 6 to 18 in., plates ¼ to ¾-in. thick—its total weight capacity being 7000 lb. Style 12-12 will handle beams of from 12 to 30 in. wide, plates ¾ to 1¼-in. thick and lift 10,000 lb.

*Steel* 9/2/46; *Item No.* 9458

## Electric Meter

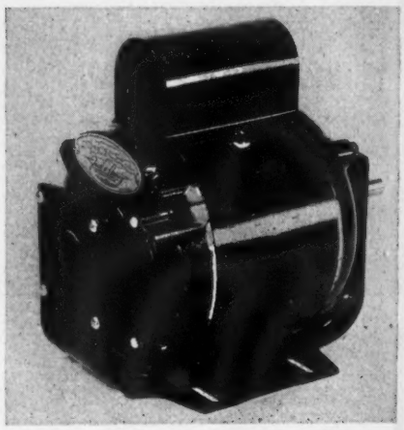
Marion Electrical Instrument Co., Manchester, N. H., announces a new instrument designed to permit user to assemble an instrument to be used as a voltmeter, milliameter, low and high resistance ohmmeter, for alternating-current and decibel meter. Offered in three sizes, each of which is interchangeable electrically, instrument has a basic sensitivity of 400 microamperes and an internal resistance of 500 ohms, plus or minus 1 per cent.

Ranges include 0 to 250 v ac-dc, 0 to 500 ohms and minus 10 megohms, and minus 10 to plus 14 decibels. By use of proper multiplier voltmeter scale can also be used as 0 to 1000 v.

*Steel* 9/2/46; *Item No.* 9370

## Induction Motors

Fractional horsepower induction motors with die-cast aluminum end bells for keeping bearing temperatures low are latest products of Jack & Heintz Precision Industries Inc., Cleveland 1. Offered at 1725 rpm, ratings are 1/6, ¼ 1/3 and



½-hp, and all are constant speed, continuous duty, single phase, 60 cycle, 115 v motors.

Designated as Type C-2, motors are built in two styles, normal and general purpose. Former is for applications which do not require high performance, heavy-duty characteristics of general purpose design. Latter type has high starting torque, low starting current and maximum running torque in excess of 300 per cent

**FOR MORE INFORMATION** on the new products and equipment mentioned in this section, fill in this form and return to us. It will receive prompt attention.

*Circle numbers below corresponding to those of items in which you are interested:*

| | | |
|---|---|---|
| 9530 | 9370 | 9360 |
| 9740 | 9456 | 9327 |
| 9503 | 9503 | 9373 |
| 9500 | 9516 | 9506 |
| 9513 | 9471 | 9534 |
| 9458 | | 9501 |

9-2-46

NAME..... TITLE.....

COMPANY .....

PRODUCTS MADE .....

STREET .....

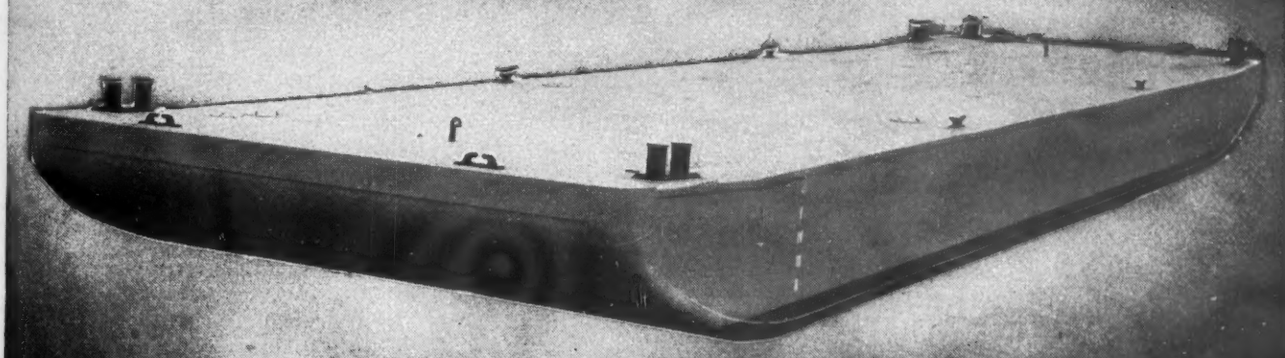
CITY and ZONE..... STATE.....

**Mail to: STEEL, Engineering Dept.—1213 West Third St., Cleveland 13, Ohio**

*(All claims are those of respective manufacturers; for additional information fill in and return the coupon on this page.)*

# BARGES

## for every purpose



Liquid—dry cargo—drilling rigs—derricks. Look over our stock designs—or let our engineers design a barge to suit your particular needs.

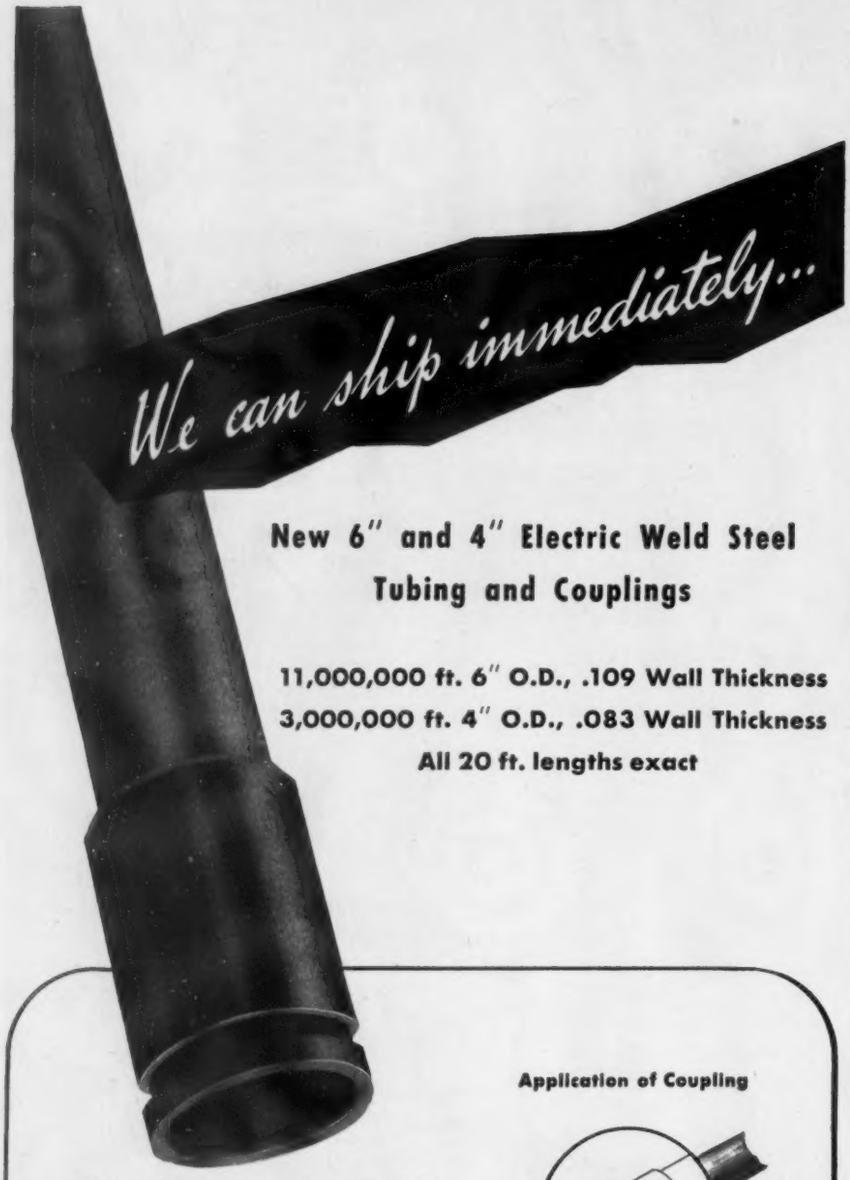
Pictured here is an all-purpose barge to meet post-war requirements. It can be used for either deck or liquid cargo. Notice the long, plated rake—for swifter, easier towing. Dimensions: 110' x 30' x 7'. Capacity: 450 tons of deck or 3,200 barrels of liquid cargo.

STEEL

AVONDALE MARINE WAYS, INC.

TELEPHONE: OFFICE AND PLANT, WALNUT 8970

RIVER FRONT, NEW ORLEANS DISTRICT, WESTWEGO, LOUISIANA




**New 6" and 4" Electric Weld Steel Tubing and Couplings**

**11,000,000 ft. 6" O.D., .109 Wall Thickness**
**3,000,000 ft. 4" O.D., .083 Wall Thickness**
**All 20 ft. lengths exact**

This tubing is new, excellent and has been hydrostatically tested to 900 pound pressure p.s.i. Every 20 foot length of tubing has welded on each end a 6" (6⅝" O.D.) or 4" (4½" O.D.) pipe nipple which is grooved for use with Victaulic type coupling.

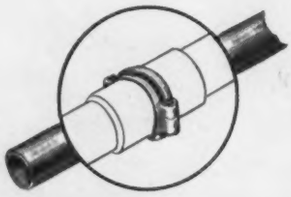
This tubing is recommended for normal use and application on steam, oil, gas and water lines, for columns and other structural purposes.

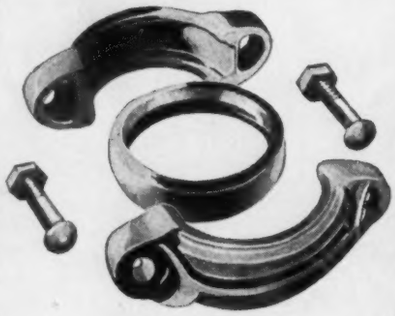
Prompt shipments can be made from various locations throughout Ohio, Pennsylvania, New York, New Jersey, Illinois, Missouri and Virginia.

Prices will be submitted upon application, and special arrangements are available to jobbers.

Representative samples of both sizes of couplings and tubing may be inspected at our various warehouses.

**Application of Coupling**





**Coupling Detail**

**Albert Pipe Supply Company**
**Berry & North 13th Street**
**Brooklyn 11, New York**
**Phone Evergreen 7-8100**

**L. B. Foster Company**
**P.O. Box 1647**
**Pittsburgh 30, Pa.**
**Walnut 3300**

**Albert & Davidson Pipe Corp.**
**2nd Avenue—50th, 51st Street**
**Brooklyn 32, New York**
**Phone Windsor 9-6300**




of full load torque of the induction motor.

All motors have pressure cast aluminum rotor winding, snap-action starting switch and steel backed babbitt lined diamond bored bearings with oil grooves to distribute oil over entire bearing length.

*Steel* 9/2/46; *Item No.* 9456

## Hole Gage

A model 1203 P-1 dial indicator gage for extremely small holes is being marketed by Federal Products Corp., 1144 Eddy street, Providence, R. I. It gages holes as small as 0.122-in. and up to 0.250-in. It will also gage these small

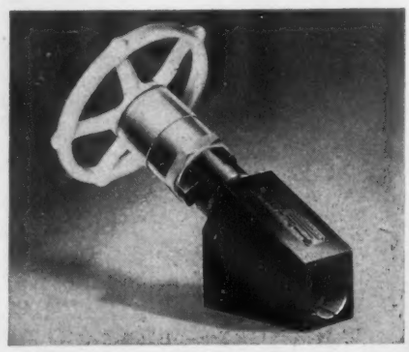
holes up to depths as great as 2¼-in. Variations within the range are obtained by use of a set of twelve interchangeable gaging plugs.

Gage is calibrated and set for any specified inside diameter to reveal condition of holes up to a total range of plus or minus 0.004-in. The minimum graduation is 0.0001-in.

*Steel* 9/2/46; *Item No.* 9503

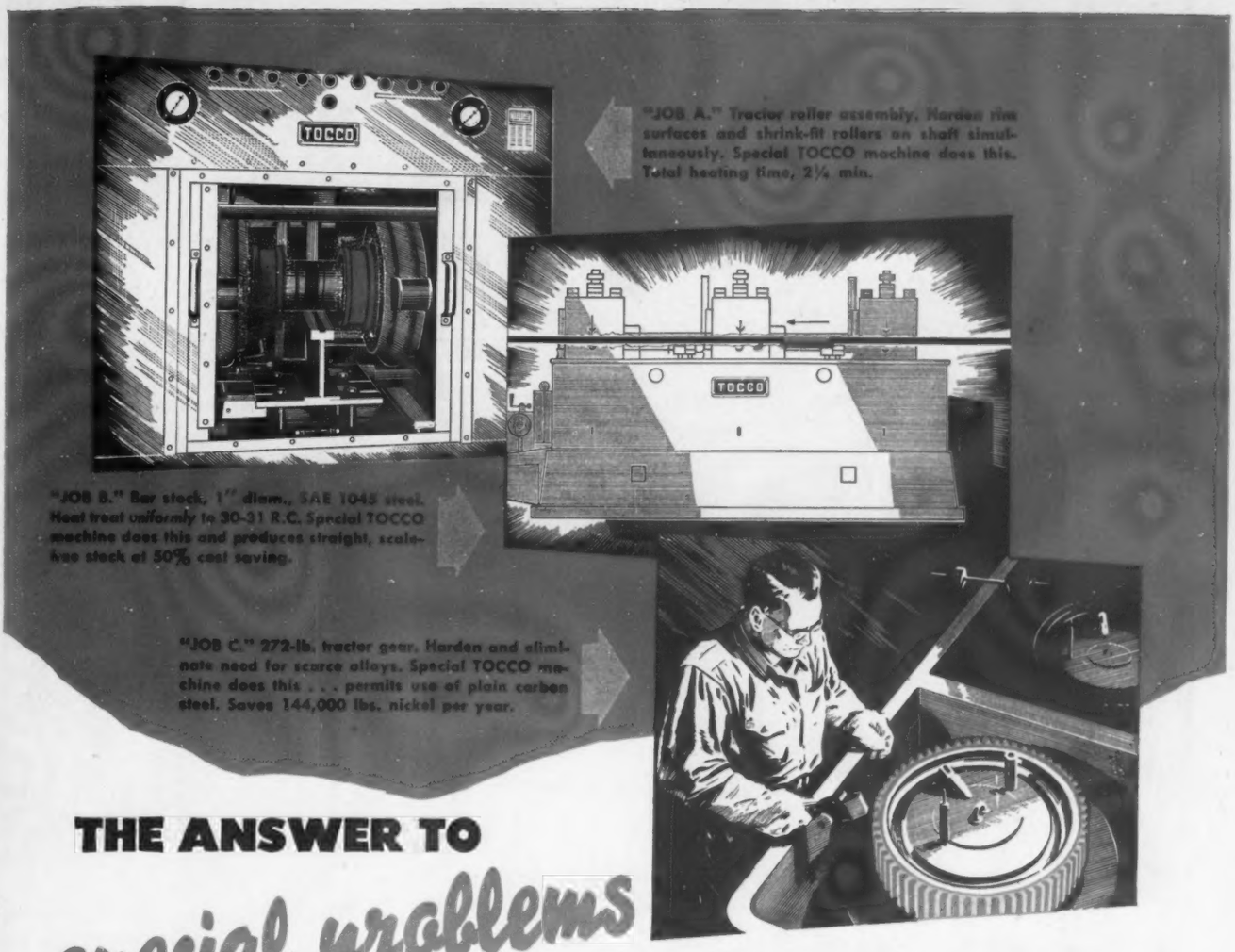
## Globe Valve

Extreme 30 degree valve body design in globe pattern effects a minimum change in direction of flow in the new valve designed by Grove Regulator Co., 65th and Hollis streets, Oakland, Calif. Tur-



bulence is almost entirely eliminated as expansion takes place into downstream line after flow has passed through valve.

A one piece stem and plug effects a


TOCCO
"JOB A." Tractor roller assembly. Harden rim surfaces and shrink-fit rollers on shaft simultaneously. Special TOCCO machine does this. Total heating time, 2¼ min.
TOCCO
"JOB B." Bar stock, 1" diam., SAE 1045 steel. Heat treat uniformly to 30-31 R.C. Special TOCCO machine does this and produces straight, scale-free stock at 50% cost saving.
"JOB C." 272-lb. tractor gear. Harden and eliminate need for scarce alloys. Special TOCCO machine does this . . . permits use of plain carbon steel. Saves 144,000 lbs. nickel per year.

# THE ANSWER TO *special problems* IN INDUCTION HEATING

**PROBLEM:** "My application is *special.* How can I get Induction Heating equipment to match my job *exactly?*"

**ANSWER:** Call in the TOCCO Engineer. He can give you an unbiased analysis of your problem and prescribe special equipment to match your job exactly because he is backed by:

*The TOCCO Development Laboratory*—largest of its kind in the world. Completely equipped and expertly staffed, this Laboratory finds the answer to hundreds of unique problems . . . and develops *special* TOCCO machines to match the job accurately (such as "A", "B", "C", above).

Remember, too, that the TOCCO Engineer can solve the "standard" problems quickly and accurately because he has available:

*The world's most complete line of Induction Heating Equipment*—standard TOCCO models, including motor-generator and electronic tube types of machines. One of these units with proper TOCCO fixture provides the correct answer for average applications.

Take advantage of these features of TOCCO Leadership to assure the fullest benefits from Induction Heating. The TOCCO Laboratory is described fully in the 20-page brochure, "Research for Results." Mail the coupon.

**THE OHIO CRANKSHAFT COMPANY**

**TOCCO**

MAIL COUPON FOR BOOKLET

The Ohio Crankshaft Co.
Dept. S, Cleveland 1, Ohio

Send free copy "Research for Results"

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# BUILT FOR TOUGH JOBS!

• The invisible strength of this mighty giant lifts and places heavy loads at your command.

The rugged construction of Shepard Niles Single Beam Cranes assures added handling economy resulting in extra value in terms of production economy. Shepard Niles Cranes are made tough and durable to give long, dependable service. They are made in many types, capacities and spans to fit your particular need.

*To meet competitive production schedules — to maintain smooth-flowing production lines, material handling equipment must stand up under severe operating conditions. You'll get capacity load-handling, long efficient service at low maintenance cost with a Shepard Niles Hoist.*

**Shepard Niles**
**CRANE & HOIST CORPORATION**

Improve your competitive position in the industrial world. A request will bring you full data and tell you how you can put a Shepard Niles Crane to efficient use in your factory.

**358 SCHUYLER AVE. • MONTOUR FALLS, N. Y.**

tight shut-off when closed. Valve stem is not directly carried by handwheel removing possibility of stem distortion.

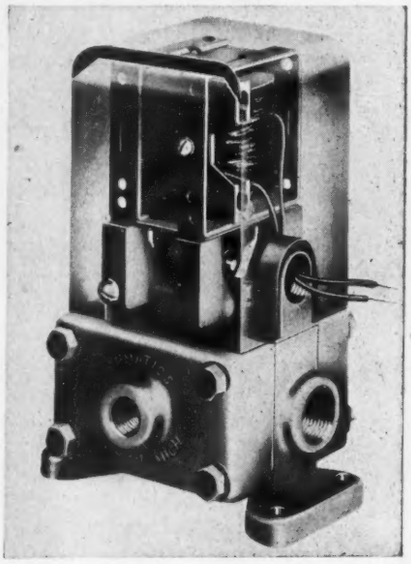
Factory sealed lubrication is zoned away from flow stream and isolated from temperature effects. All threaded surfaces and operating parts are protected from paint, dirt and damage by an encasing cap shield.

*Steel* 9/2/46; *Item No.* 9516

## Three-Way Valve

A solenoid-controlled 3-way valve for compressed air, announced by Numatics, Milford, Mich., is designed to eliminate pounding action. Its plunger travels only a short distance—a maximum of only 7/64-in.

Exhaust port of valve is one pipe-size larger than supply and outlet, providing



rapid dissipation of exhaust air. Its solenoid draws less than 3 amp on 110-v 60-cycle current.

Setup desired may be selected by reversing supply and outlet manifolds on center body—making it open to exhaust and closed to pressure, or open to pressure and closed to exhaust, with solenoid energized or de-energized.

Valve is made in 6 sizes from ¼ to 1¼-in. to handle operating pressures up to 150 lb.

*Steel* 9/2/46; *Item No.* 9471

## Machine Vise

A machine vise for use with millers and other machines having a flat table surface with T slots is being manufactured by Porterfield Mfg. Co., 749 East Fifteenth street, Los Angeles. This new Milpal vise utilizes 90 per cent of longitudinal capacity and can be adjusted from zero to maximum of flat table surface.

It does not incorporate usual heavy

# 50 Men from Missouri

THESE 50 people devote their full time to engineering projects aimed at making Weatherhead products *better*—for *less.* They have "to be shown" by scientific tests just how good a product really is. And then, they often reverse the situation and show *us* how we can *improve* the products you use.

Our testing laboratories are equipped to reproduce every condition under which Weatherhead products may be used. For example—

(1) A tensile strength testing device gives brake hose a 1000 pound pull. (2) Tube fittings are subjected to 1800 vibrations a minute. (3) Hot salt is sprayed on valves and fittings to test the finish.

And there are scores of other scientific tests which help our "50 men from Missouri" determine what can be done to give you *better* Weatherhead products at *lower* cost.

It's this kind of extensive testing, plus modern methods of product development, design, and manufacturing, which is making *"Look Ahead With Weatherhead"* more than a slogan!

*Look Ahead with*

# Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND 8, OHIO

NEW YORK • DETROIT • CHICAGO • ST. LOUIS • LOS ANGELES

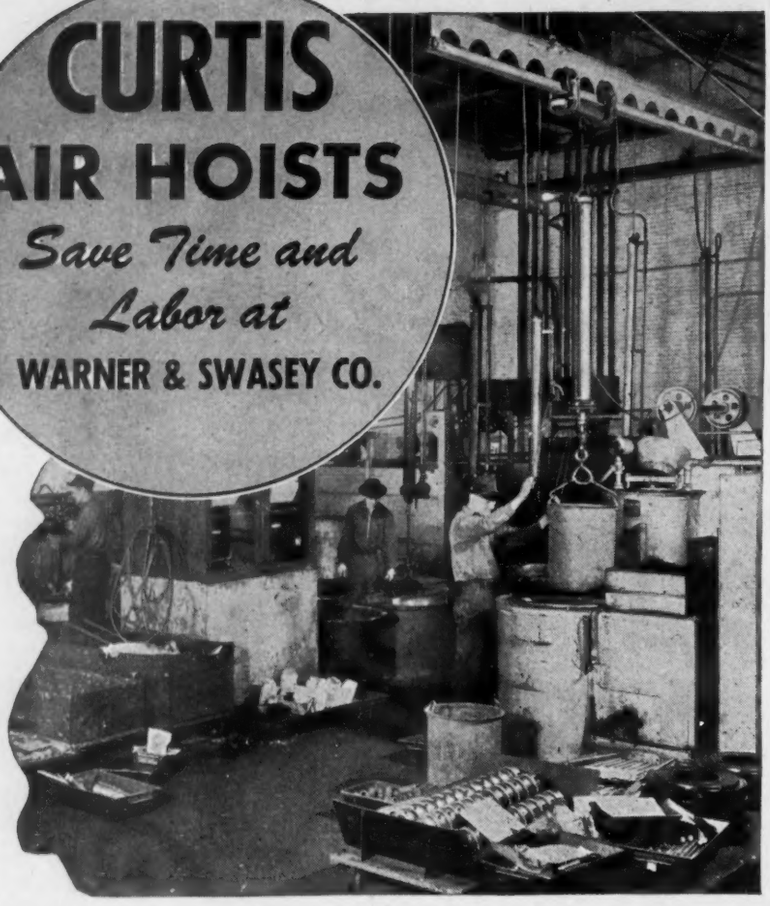
**ATTENTION DESIGN ENGINEERS**

**You can benefit most by calling Weatherhead while your product is in early design stages. A thorough study of your products can often result in improved performance, simplified serviceability, and savings in assembly time and labor.**

# CURTIS AIR HOISTS

*Save Time and Labor at*

**WARNER & SWASEY CO.**



Curtis Air Hoist used in operating the Cleveland Tramrail System in the heat-treating department of Warner & Swasey Co., Cleveland.

It's another example of a well-known company relying on Curtis air-operated equipment to speed production, save time and labor, too. Curtis Air Hoists offer the following advantages to any company concerned with any lifting, pushing or pulling operation:

- **Low first cost — lowest operating expense.**
- **Smooth, fast, accurate control of load.**
- **One-man or one-woman operated.**
- **Finger-tip control.**
- **Light weight — pendant, bracketed or rope-compounded types.**
- **Cannot be overloaded.**
- **Capacities up to 10 tons.**

Find out how Curtis Air Hoists, Air Cylinders and Air Compressors can save man hours, cut costs in your plant. Write for Bulletin C-7.

*92 Years of Successful Manufacturing*

**CURTIS PNEUMATIC MACHINERY DIVISION**
***of Curtis Manufacturing Company***
1996 Kienlen Avenue, St. Louis 20, Missouri

Please send me Form C-7 on Curtis Air Hoists and Air Cylinders; also Curtis Air Compressors.

Name.....
Firm.....
Street.....
City.....Zone.....State.....



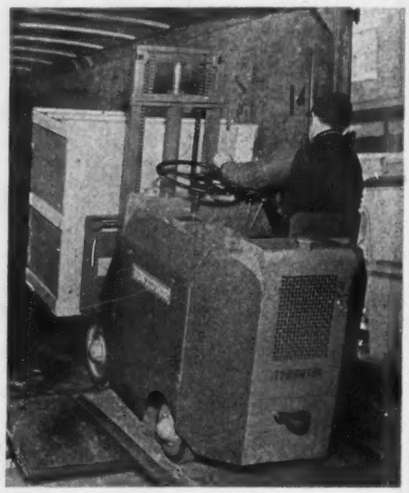

vise base, but makes use of the flat table surface, thus allowing full vertical capacity for work from table surface to cutting tool. Construction is of heavy semi-steel castings, heavy ribbing and, steel jaws. Heavy 1-in. 6-thread steel lead screw and bronze nut run in oil. True alignment is assured by key way in base of vise riding in T slot of machine's flat table. Jaws are operated manually by screw adjustment.

*Steel* 9/2/46; *Item No.* 9360

## Lift Truck

An addition to lift trucks made by Towmotor Corp., Cleveland, is the new model LT-35 which includes a side-mounted motor engineered to cut wheelbase length to 35 in.

New model weighs only 2800 lb but will lift, carry and stack a 1500 or a



2000 lb load in tight aisleways, elevators and crowded confines of highway trucks and freight cars. Truck design places operator at side of unit, making it easy for him to get on and off. Seat is fully protected front and rear.

*Steel* 9/2/46; *Item No.* 9527

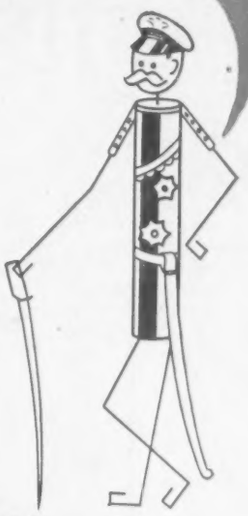
## Solenoid Valve

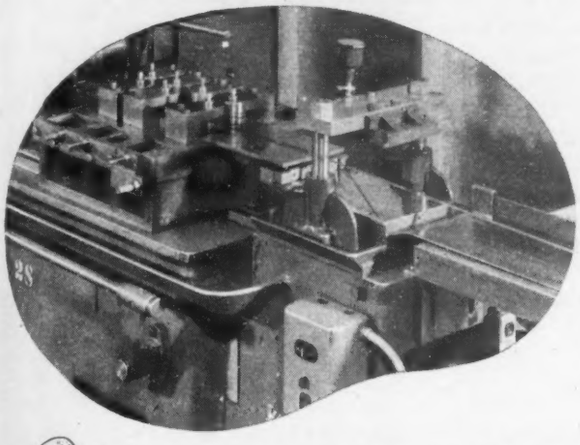
With development of a solenoid valve for high differential pressures Johnson Corp., Three Rivers, Mich., has made advantages of an automatic electric valve available for a wide range of applications. It combines immediate full flow with ability to operate under pressures as high as 150 lb for liquid level control, with hot and cold water, steam, oil and other processing liquids up to 3650° F.

Valve is direct-acting and lever arrangement provides ample power to insure positive opening. Single seat construction eliminates trouble encountered when silt or other foreign matter freezes the piston.

Type HH series, with sizes from ⅛ to 1½-in., is suitable for differential pres-

# GENSCO EQUIPMENT OFFERS SPECIALIZED STEEL SERVICE



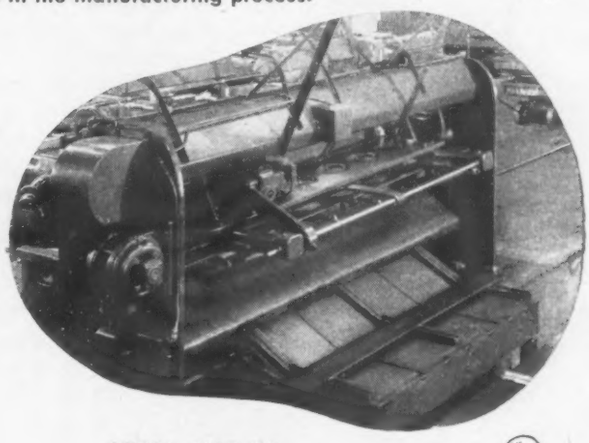


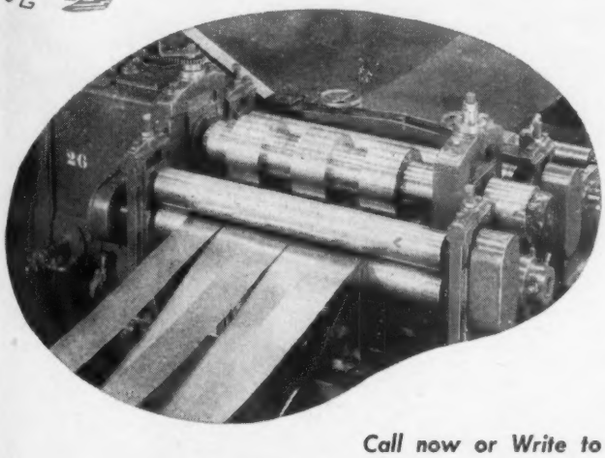
**STEEL EDGED AS YOU WANT IT**

Heavy-duty edgers used at the Gensco Plant are manned by skilled steel warehouse men. Strip steel can be round edged to your exacting requirement. To the user this service frequently means a reduction of one or more steps in the manufacturing process.

**STEEL SHEARED TO ANY SIZE . . .**

Sheet and Strip Steel can be sheared in any size to the customer's specifications. Many steel users prefer this Specialized Gensco Steel Service.





**STEEL SLIT TO EXACTING REQUIREMENTS . . .**

Modern Slitters provide Gensco customers with strip or sheet steel in any desired widths . . . for any fabricating task. Up-to-date machinery assures steels of greater uniformity and precise dimensions.

*Call now or Write to your nearest Gensco Office*

**COLD ROLLED STRIP STEEL • COILS AND STRAIGHT LENGTH • SHEET STEEL**
**COLD FINISHED BARS • SHAFTING • ROUND EDGE FLAT WIRE**
**ROUND WIRES • TEMPERED AND ANNEALED SPRING STEEL**
**SHIM STEEL • FEELER GAUGE • DRILL ROD • STEEL BALLS**

## GENERAL STEEL WAREHOUSE CO., INC.

**1830 N. Kostner Avenue, Chicago 39, Illinois • Belmont 4266**

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| Vanderbilt 6-2750 | Plaza 1470 | Broadway 7629 | Wydown 1368 | Cherry 4457 |

# automatic shears by HALLDEN

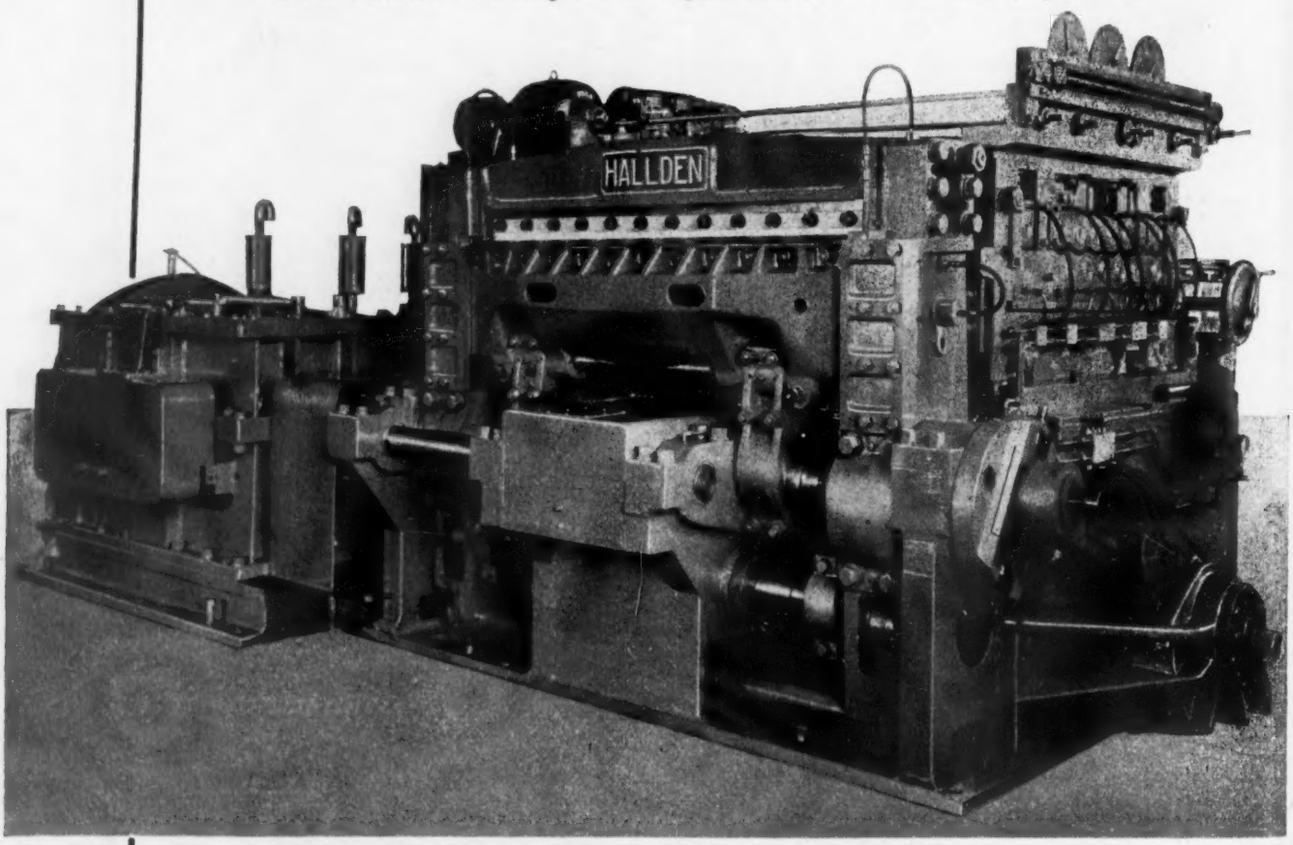
Here's a machine that takes the strip metal from coil, hot bed, or trimmer, flattens it, cuts it accurately into pieces of predetermined length, and piles the pieces neatly upon a conveyor, table or truck. It is a triumph of Hallden engineering.

Consisting of two units, a flattener and a flying shear, it is driven in combination and so timed that during the period of cutting off, the shear moves forward with the exact speed of the metal. The flying shear is a rocker type guillotine design, constructed of a special alloy welded steel. Shear knives are standard type. Each blade has four cutting edges; top and bottom blades are interchangeable, and both blades always move in a mutual plane.

The flattener consists of a 10-roll flattener with two pairs of feed rolls, each roll driven through a coupling. Flattening rolls are constructed of an alloy chrome steel, hardened and ground to a scleroscope of 90. All rolls are easily removed for grinding.

The machine is designed to cut the metal lengths to an accuracy of 1/32 of an inch. Heavy and rugged, with a low center of gravity, it stands up under continuous service without any attention other than oiling. Simple, rugged and entirely automatic, it is very compact and requires little space.

*Hallden Automatic Flattening and Cutting Machine for ⅛" Thick Steel Strip No. 56*




## The Hallden Machine Company

**THOMASTON, CONNECTICUT**

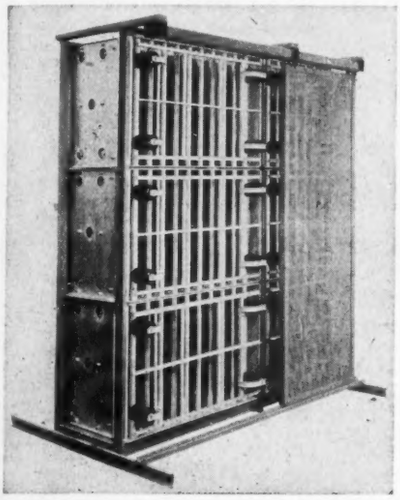
SALES REPRESENTATIVES:
THE WEAN ENGINEERING COMPANY, INC., WARREN, O.
W. H. A. ROBERTSON & CO., LTD., BEDFORD, ENGLAND

sures ranging from 125 to 150 lb; Type HL, sizes 1 to 3 in., is for medium and low differential pressures. Models are furnished for operation 110, 220, or 440 v 60 cycle current.

*Steel* 9/2/46; *Item No.* 9573

## Air Cleaner

When installed in duct systems of industrial air-circulating and conditioning installations, the electronic dust Precipitator developed recently by Raytheon Mfg. Co., Waltham, Mass., removes 90 per cent of all airborne dirt. Manufactured by the company's Industrial Elec-



tronics Division, the equipment also is capable of removing smoke, pollen, oil mist and other contaminating particles.

Equipment consists of three principal parts—dust collector cell, ionizer unit and power supply. Electrostatic action of the equipment takes all airborne contaminating particles through an electrostatic field where they become charged, then precipitated onto collector plates which are alternately charged with a high voltage.

*Steel* 9/2/46; *Item No.* 9506

## Portable Mullor

Beardsley & Piper Co., 2124 North Cicero avenue, Chicago 39, announces a portable model No. 7 Mulbaro for mulling both molding and core sand. It is composed of two separate units: 3-wheeled barrow and mulling mechanism.

Barrow carries and holds sand while it is being mulled. It has a spring controlled, hinged bowl to facilitate ease of loading and dumping. When the barrow is to be refilled with sand, bowl is tipped back to a 45 degree angle for an easy shoveling angle. As weight of sand increases, it gradually forces bowl down to a level position.

Mulling mechanism, operated by an

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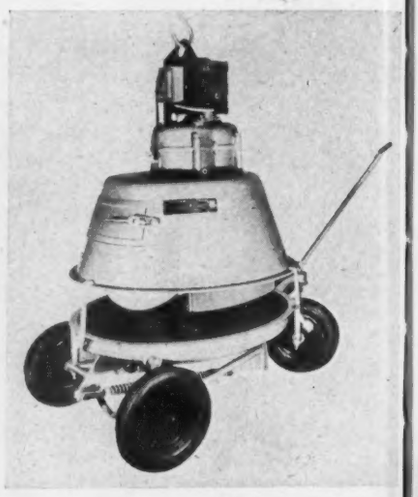
electric motor, is suspended by a chain and is lowered and attached to barrow for mulling operation. Mechanism includes two rubber-covered wheels which fit down into sand in barrow. These are designed to the contour of the barrow bowl. Squeezing and kneading action



provides proper distribution of all additions and produces a thoroughly mulled sand.

*Steel* 9/2/46; *Item No.* 9534

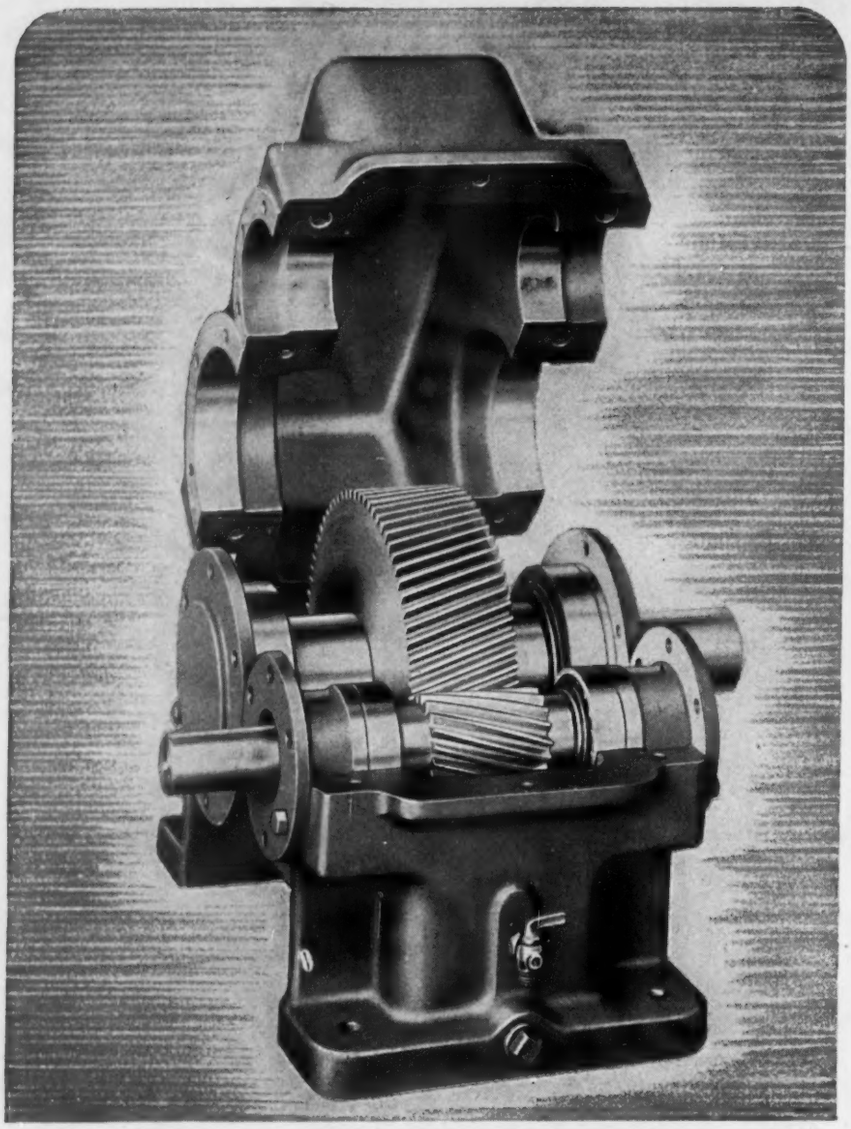
## Fire Extinguisher

Randolph Laboratories Inc., 8 East Kinzie street, Chicago 11, is producing a new trigger-touch 15-lb $CO_2$ extinguisher that is operated with one hand. On approaching fire, operator grasps nozzle

handle, aims it at the base of flames. One touch of the thumb-trigger discharges a penetrating, snowy blanket of carbon dioxide gas. Release of the trigger automatically stops flow, saving remainder of charge.

Long-range hose and nozzle keeps firefighter at a safe distance from heat of blaze and permits easy access without danger, to overhead side-wall or engine compartment fires.

*Steel* 9/2/46; *Item No.* 9501

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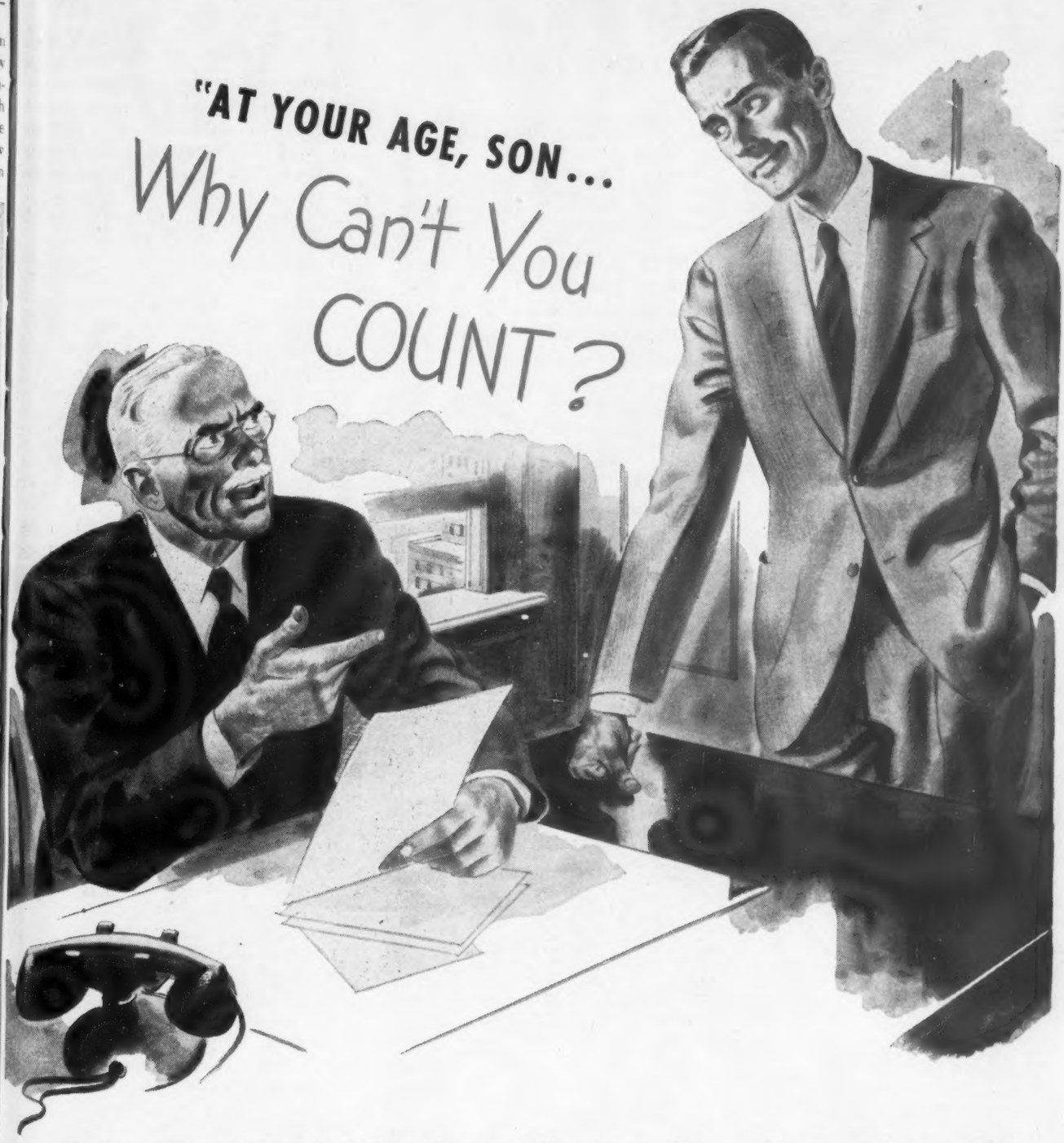


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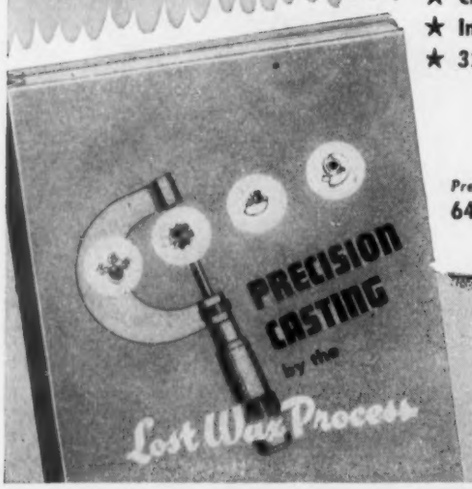


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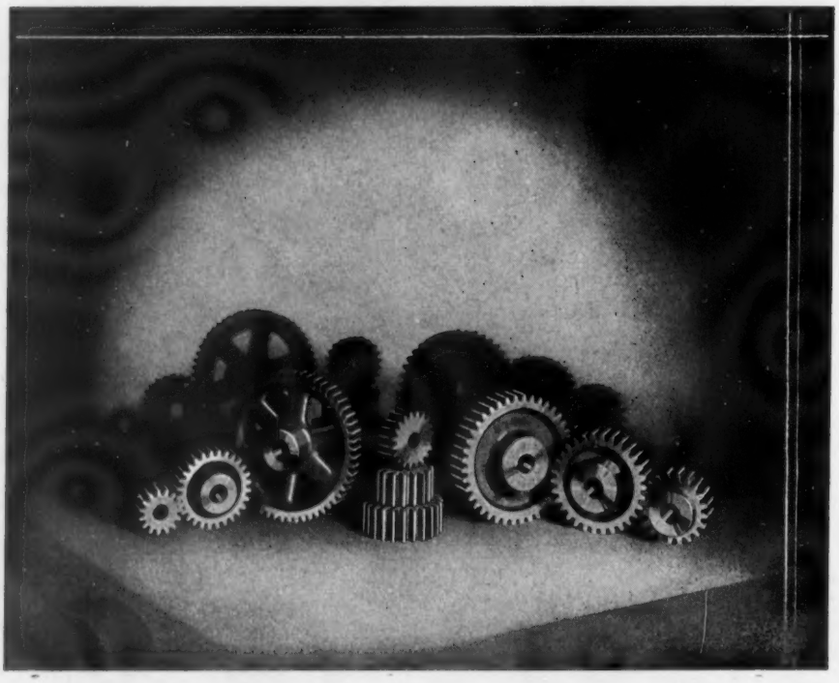

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## Tube Bending

(*Continued from Page* 95)

usually employs welded steel tubing which often has hard spots in it and is full of internal strains. It is difficult to work this tubing into the desired shapes without distortion. Better bends are made of stress relieved or seamless tubing but the quality of welded tube is generally good enough for the purpose. In handling strips and shapes, the problem is more acute. The price difference between the cheapest cold rolled and that which is stress relieved is often no more than 75 cents per 100 lb, but the loss in production from reworking the cheaper grade in order to make it meet the tolerances, is often 5 or 10 times the saving effected. Nothing is gained and often much is lost by trying to fabricate cheap stock, but the buyer usually will not admit it. He saves 75 cents in material and spends $5 in increased fabrication costs, rather than realize the overall saving by using quality materials.

### Applying Bending Moment

A bending machine is merely a means of applying a bending moment. The moment is what bends the tube. A moment is a force acting at a given distance. This varies with the kind of tube, the way in which it is made, its heat treatment, and so forth. For ordinary pipe, 21,700 in.-lb is required to bend a 2 in. extra heavy pipe. In a compression machine, both the force and the distance are adjustable. This is not true of a draw machine, but the mandrel corrects any irregularity which may exist. All materials have their own peculiarities as to moments. For steel tube, the force should be large and the distance small; for steel pipe, the reverse is true. Not too much is known about the theory of cold work. The calculation of strengths however, is simple. The old formula of mechanics is used: $F = \frac{MY}{I}$.

When F is the tensile of the material at yield, M is the bending moment, I is the moment of inertia, and Y is the distance from the axis to the outside fiber.

$\frac{I}{Y}$ = the section modulus (S),

therefore $F = \frac{M}{S}$

Therefore $M = F \times S$ which gives the moment required to bend the shape. This must be supplied by the machine. For a compression machine $M = \text{Torque } (\text{Sin}A)^2$ where A is the angle between the point of bend and the point of application of the force. This usually boils down to $M = 0.1 \times T$. From this

# PAGE *Welding* ELECTRODES

## Here's ANOTHER New One

### *Hi-Tensile "M" Shielded Arc*

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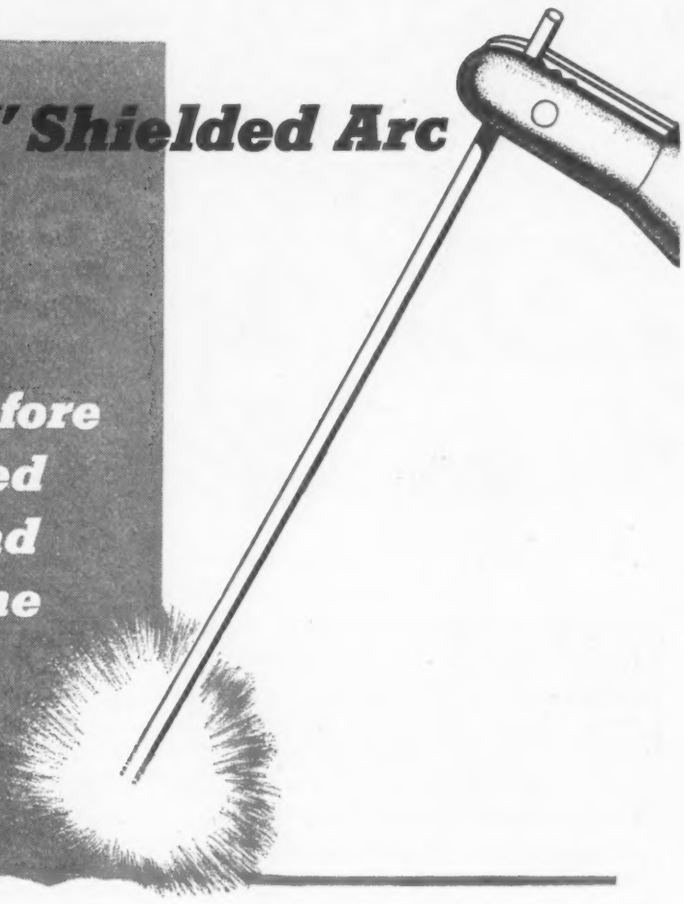

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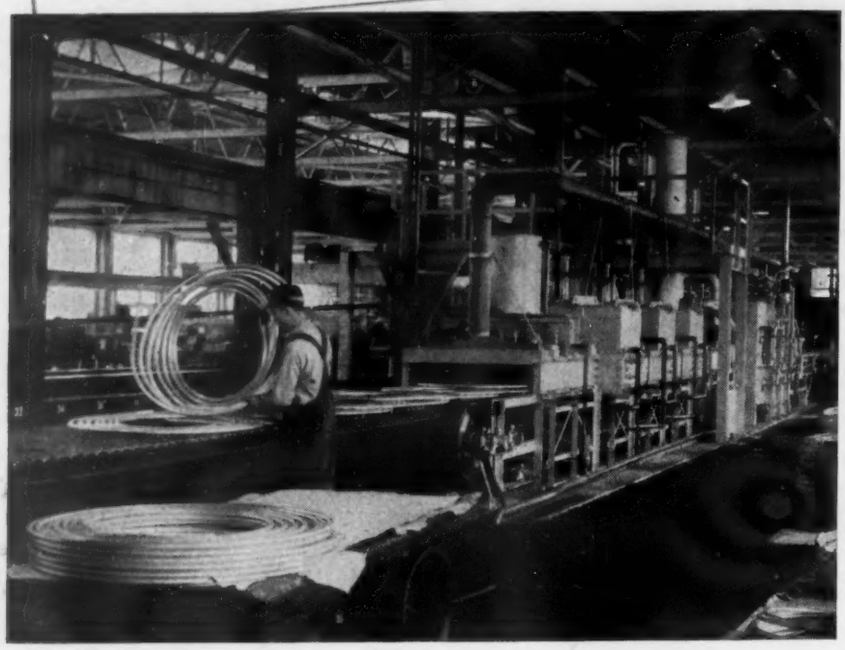

*THE PROBLEM...* A plant was hampered by the occasional stoppage of a roller-bearing conveyor. This conveyor passes through a temperature zone just below 600° F. A light oil was used for lubrication and the extreme heat caused the conveyor bearings to become carbonized.

*THE DIAGNOSIS...* A Penola Industrial Engineer was called in to remedy this. He noted the formation of carbon on the bearings which indicated the need for a lubricant that would leave no carbon or gummy residue when vaporized, and lubricate the bearings in the hot zone.

*THE PRESCRIPTION...*

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applied by an automatic lubricator just before the conveyor first comes in contact with the heat. The Van Caloria is a special high temperature lubricant containing a small amount of colloidal graphite. The oil left no residue and the graphite was present to protect the bearings until more Van Caloria was applied . . . and for over a year since the application, there have been no shutdowns—another Penola solution representing a saving of time, money and materials!

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can be calculated the size of the machine.

In the draw machine, the formula is simpler. Here $M = 0.6 \times T$, where the factor (0.6) is a constant used to overcome friction. This varies as the lubrication of the mandrel is improved and as the shoe is lubricated.

## Gage Design

(*Concluded from Page* 115)

screw. Tests have indicated that gage will adjust round within 0.0002-in. over the full range of adjustment, which, for example, is 0.005-in. for a 1-in. gage. In addition to adjusting round and along the helix of the thread, the gage weighs only half as much as conventional types, as well as having a softer and warmer "feel" by virtue of the aluminum gage body. Premium grades of tool steels may be used in the insert portion, yielding additional life and savings in cost against making the entire gage out of such material. Overall dimensions of the combination ring gages are the same as American gage design standard, size for size.

## Bullet Making at Chrysler Described in Book

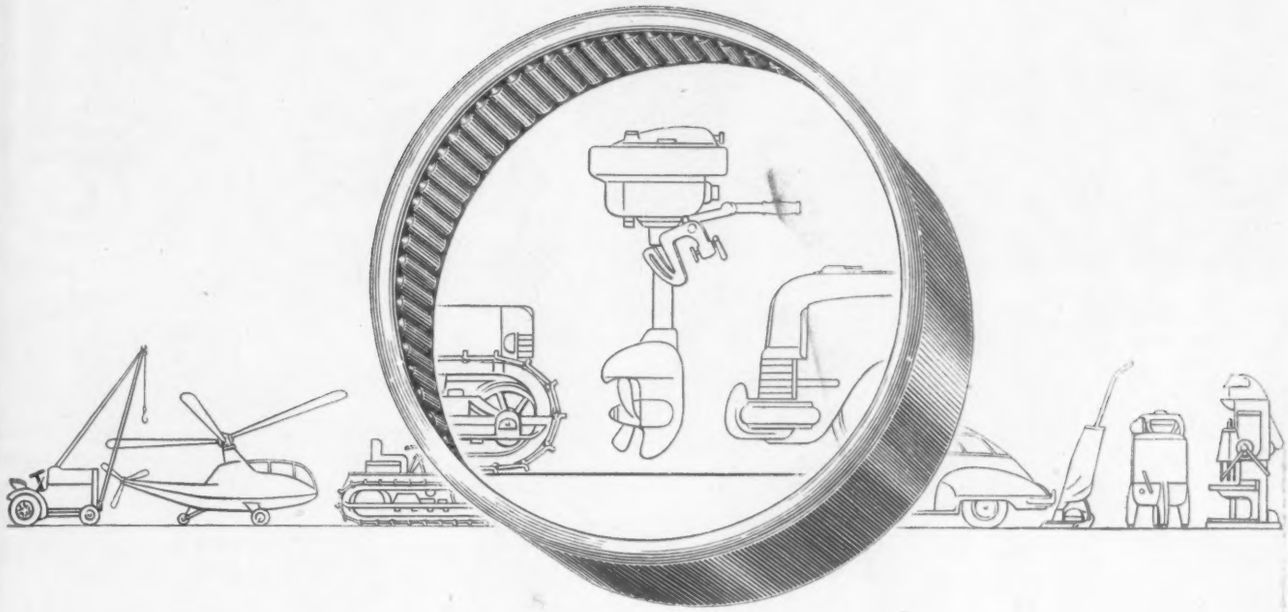
Story of war-time operation of Chrysler's Evansville, Ind., plant in the production of small arms and special ammunition for the Army is now told in a bound, illustrated, 77 page booklet published by Chrysler Corp., Detroit. Entitled "Bullets By the Billion," book embodies facts and figures including some material not previously made public, on planning, production procedures, inspection and packaging of ammunition.

The Evansville plant is said to have turned out more than three billion .45 caliber cartridges, almost half a billion .30 caliber cartridges, hundreds of thousands of rounds of special types of ammunition; specially packed a billion and a half rounds of ammunition for use in the Pacific.

## Silicone Resin Used In Heat Resistant Paints

New thermosetting silicone resin designed for use in formulating heat and moisture-resistant paints having a hard, mar-resistant surface was developed by Dow Corning Corp., Midland, Mich.

Known as DC 804, resin 60 per cent by weight, with toluene as the solvent, is said to be recommended especially for use in white finishes having properties between those of ceramic coatings and ordinary organic paints. Because of the resistance of this silicone resin to oxidation, ozone and ultra-violet radiation, finishes do not become yellow with age.



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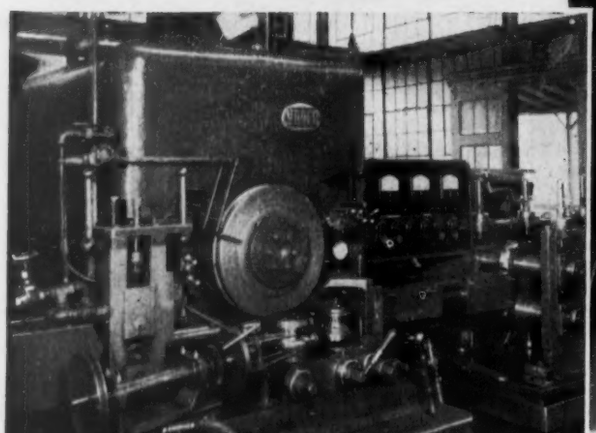
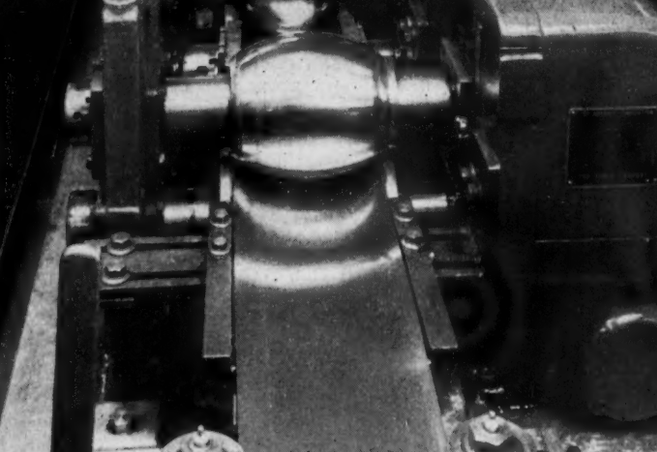


**YODER** parallel-electrode high efficiency resistance welder welds butted edges of formed tube as it comes from the mill, then strips flash so smoothly no seam shows. There's a Yoder welder sized to each mill capacity —up to 1,500 KVA.



**YODER** sizing mill straightens and accurately sizes tubing (round, square, or eliptical as desired). Automatic cutoff delivers desired lengths at the speed of the mill. Other types of Yoder mills form moulding, angles or channels of every conceivable cross section.

*Descriptive literature available on request.*

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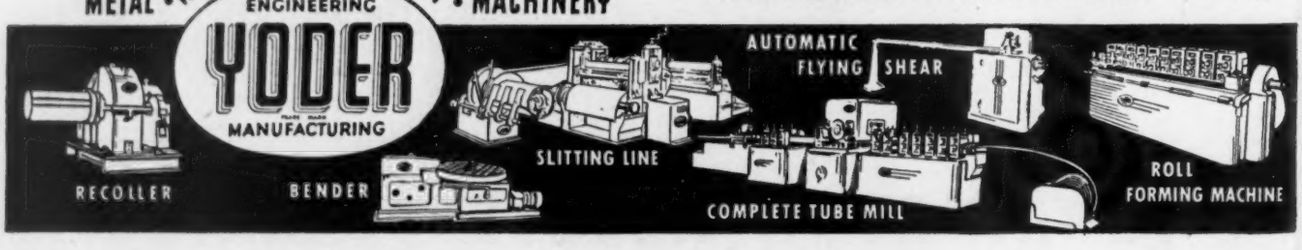

## Bucket Elevator

(*Concluded from Page* 110)

by chute or by conveyor extending directly over the bucket line at foot; it can be discharged at top to either side, through a rubber lined chute or directly to a conveyor extending under the bucket line. Low loading height eliminates need for mounting elevator in a pit or installing an inclined feeder or other complicated construction.

Higher handling capacity can be gained by using double head shaft designed for increasing elevator speed. Adjustment of bucket line is provided by spring-type takeups installed at top of single head shaft elevators. Bucket line adjustment of double head shaft elevators is made at foot.

Fig. 2 is perspective wash drawing of elevator with single head shaft showing an installation for lifting metallic pieces out of an oil quenching tank, after heat treatment, see Fig. 3. Elevator buckets are perforated to permit draining oil back into tank. Considerable floor space is saved by this vertical installation.

When chain rollers engage sprocket wheels at the top of ascent, loaded buckets are inverted, discharging their contents inwardly. Because of the slow travel speed, centrifugal action is practically absent; load falls to a mesh chute on this installation.

## Flash-Butt Welding Booklet Offered

Prepared by the Automative Welding Committee of the American Welding Society, a booklet containing fundamental data on flash-butt welding as used in the automotive industry, has recently been made available. Included are sections on automotive-type steels, flash-welding equipment, design considerations, tooling, techniques and inspection. Sketches show both good and and poor joint designs of typical automotive flash-welding assemblies.

The 22-page booklet may be obtained from the society, 33 West 39th street, New York 18, for 30 cents per copy.

## Publication Contains Joining Information

Photographs of applications of the company's products to war-time metal joining problems from delicate aluminum to such machinery as heavy stamping equipment, are included in a special issue of "The Eutectic Welder," published by Eutectic Welding Alloys Corp., New York. Publication discusses war and peace time applications of the company's welding alloys along with their advantages.

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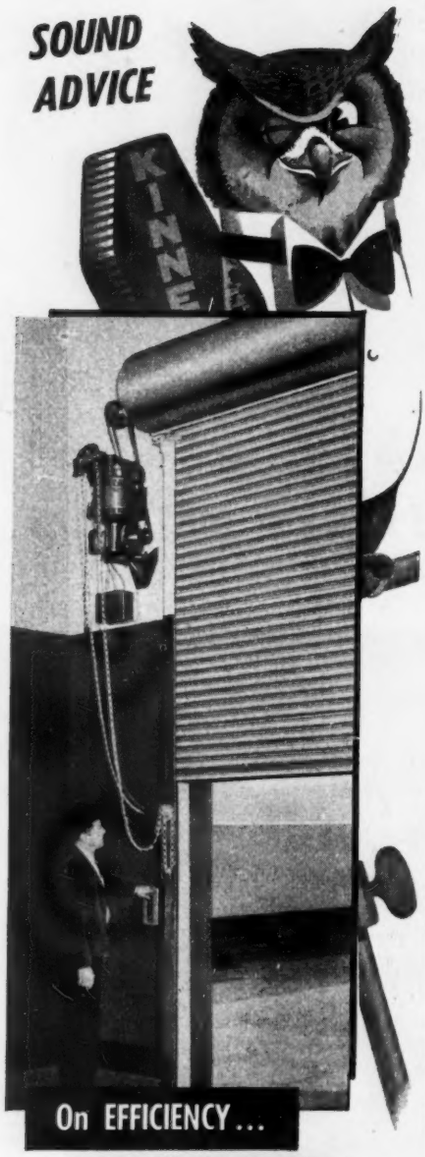


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## Controlling Distortion

(*Concluded from Page* 101)

deviations in the hull plating, but this only made it evident that a more exacting method would have to be devised.

It was found that if elevations were taken daily on the pontoon deck while the welding sequence was being executed a more exacting check could be made so far as hogging or sagging was concerned.

Fig. 3 (A) shows a general plan of a dry dock pontoon deck. By dividing the deck shown here into eighteen spaces longitudinally, i. e., starting at frame No. 1 and spotting every third frame, then spotting shots at the dock centerline and at each wing-wall base transversely, an accurate tally could be maintained to show progressional deviations. In lieu of actual elevation figures the deviations were shown as being plus or minus from the transverse centerline elevation. The elevation at the transverse centerline, frame 28, was considered at 0.00.

Fig. 3 (B) is a chart showing the deviations in the pontoon deck so that the differences can be compared more easily, longitudinally and transversely, by stations.

### Elevations Taken At Same Time

Since metals expand and contract with atmospheric temperature changes, it was evident that elevations taken at different hours of the day would differ greatly even though welding operations had ceased during that period. By experimentation, it was found that by taking elevations at the same time of day, each day, the most uniform tally was produced, and corrective measures were more easily controlled. At most construction activities the elevations were finally taken between the hours of 7 and 8 a.m. This was the procedure which the Bureau of Yards and Docks adopted and applied to the construction of 77 floating steel drydocks fabricated between 1943 and 1946.

Having determined the progressional deviations each day by the time operations started, it was easy to position the welders so that a minimum of distortion would result from the day's operations. When the structure at the pontoon deck elevation showed a tendency to toe-up, the welders were positioned so the welding in that area would be retarded while the welding along the keel or bilge area would be accelerated. Varying the welding speeds and sequence by spot check control was the answer to another difficult problem.

Under the acid-test of combat warfare these dry docks proved to be stable and serviceable beyond all expectations. Not only were they more seaworthy, because of a minimizations of residual stresses, but when ten sections were joined to create a 100,000-ton dry dock their fairness in lineage and levelness insured speedy assembly and continuity of structure. In the case of three sectional docks, compliance with tolerances allowed by means of survey control, guaranteed full bearing of the center section on the end sections, and on all docks the setting of and the operation of deck gear, such as bilge block runners, bilge and keel blocks, etc., which were of major importance in the repairing of battle-damaged craft. At one location a three sectional dock was constructed with only ⅜-in. deviation over a deck length of 528 ft.

These results were realized only because they were carefully engineered, and through the efforts of conscientious supervisors who knew the value of analyzing small details for corrective measures and the mechanics of application.

## Profiling Machine

(*Concluded from Page* 126)

which many different designs present. On under side of slide is mounted master hydraulic cylinder, which is controlled by stylus for duplicating work running parallel to machine spindle, see Fig. 2. Another master cylinder is attached to cross slide in side machine ways for duplicating work which runs at right angles to spindle, see Fig. 4.

Hydraulic pump unit, which includes oil tank, motor, pump, relief valve and pressure gage, is separate and may be located convenient to machine. A typical installation is shown in Fig. 1. Flexible hose connects pump with master cylinder and control valve stylus.

No complicated mechanisms, levers or controls interfere with operator while machine is in operation. Operator has complete control of machine at all times and can easily watch cutting tool at work.

Profiling arrangement may be disengaged and regular cutting tool inserted to operate lathe on regular work. Usual stop collar on feed rod will disengage feed at any predetermined position.

## Electronic Maintenance Booklet Offered

Six basic maintenance operations—cleaning, inspecting, feeling, tightening, adjusting and lubricating—are covered in the handbook B-3658 on maintenance of electronic equipment recently issued by Westinghouse Electric Corp., P.O. Box 868, Pittsburgh 30. These operations are applied to vacuum and ignitron tubes, capacitors, resistors, fuses, transformers, terminal blocks, meters and other components of electronic equipment. Book may be obtained by writing the company.

## Cleaning Machine

(*Concluded from Page* 118)

forms a basket E, made from ¾-in. mesh wire. Two round pins F, fastened to this basket are made so as to have a good sliding fit in slots machined in drum C, as shown in Fig. 4.

When drum C is revolved by means of the bevel gears the basket also revolves because drum and basket are held in contact by means of pins F. On the basket are two projections H and fastened to outer shell are two cams G. Figs. 1 and 2 show location of G and H.

As drum and basket are revolving the projections H come in contact with cams G, which, by virtue of their design, cause basket to be raised out of drum a distance equal to the rise of the cams. When projections have passed the cams, basket drops back again until its flange comes in contact with the upper edge of the drum. During rise and fall of basket, pin F slides in slot in drum C, as shown in Fig. 4.

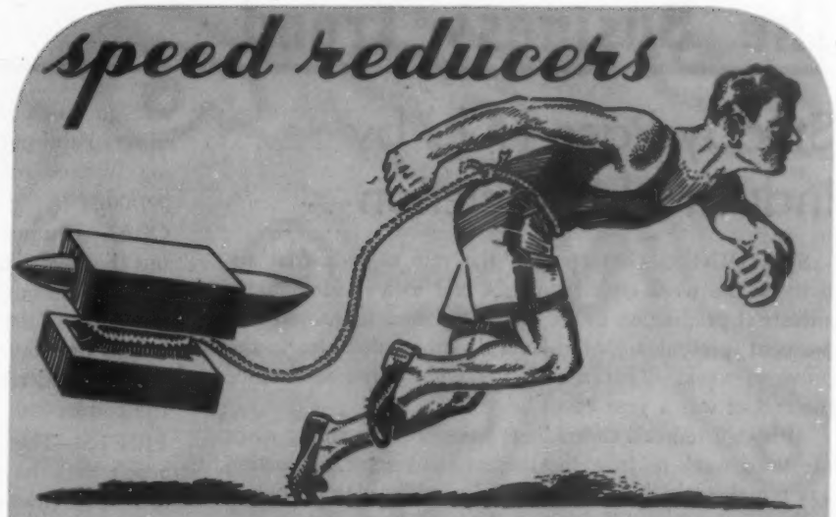
In use kerosene or other cleaning fluid is placed in the drum. Parts to be cleaned are put in the wire basket, and the hinged cover closed. The machine then is started and with the double motion the liquid is whirled against the parts which also are plunged in and out of the cleaning fluid.

This double action of the machine was found to clean articles quickly and efficiently without attention from the operator other than loading and unloading parts. A further advantage is that raising and lowering of the basket deposits dirt washed from parts into the bottom of the tank or drum C from which dirt can be removed by opening plug drain, shown in Fig. 2.

## Special Alloys Used in German Jet Turbine Blades

Analysis and description of forging, annealing and tempering of two steel alloys used by the Germans in the production of heat resistant gas turbine blades for jet planes is subject of 12-page report that may now be obtained from the Office of the Publication Board, Department of Commerce, Washington, D. C.

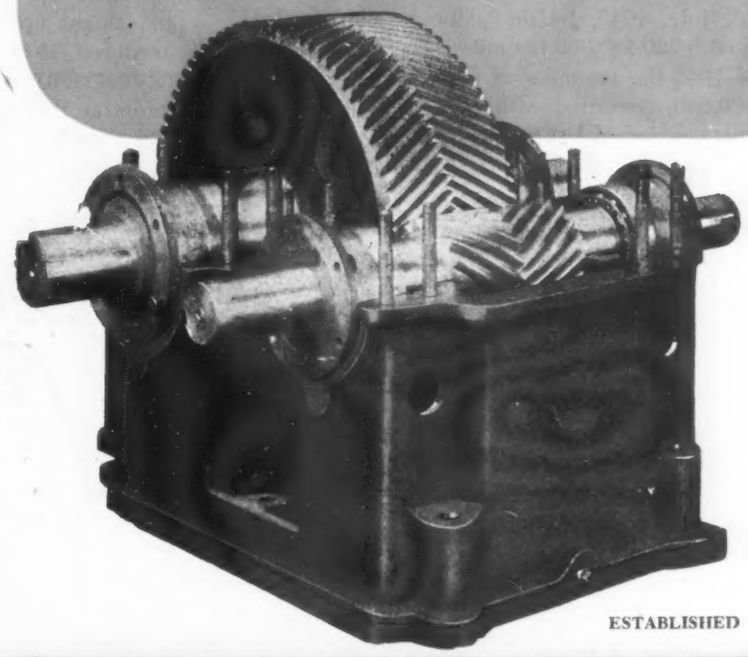
Prepared from microfilm records of data sheets of the Krupp plant at Essen, paper reveals that the alloys were made in 4-ton induction furnaces, cast in molds 32 to 38 cm square, and forged by means of rapid blows with a 6000-lb hammer. All sheet metal in high temperature service in jet planes was low carbon steel with about 0.5 per cent titanium, case hardened for oxidation resistance up to 900° F.


Speed reduction is more than a guesswork drag. It is transmission of power controlled to a hair. OTTUMWA GEAR REDUCTION UNITS are furnished in single, double and triple reductions, with respective H. P. capacities 2-1 to 10-1; 10-1 to 60-1; 50-1 to 200-1.

Typical single reduction unit illustrated here has the cover removed. They are automatically lubricated dust proof and oil tight. The OTTUMWA-Sykes gear with its continuous herringbone teeth utilizes every fraction of face width, and operates practically in silence. Our engineering department will help you select the proper reducer.

OTTUMWA cuts Sykes continuous tooth herringbone gears up to 10'2" dia. 24" face, complete in steel or semi-steel, or from blanks furnished by the customer. Much valuable technical data will be found in our catalog. This booklet will be mailed on request.



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ENGINEERS • FOUNDERS • MACHINISTS

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# The Business Trend

## Steady Pace Held by Industrial Production

STEADINESS characterized the rate of industrial activity in the week ended Aug. 24 and as a result STEEL's industrial production index for that period registered 152 per cent (preliminary), the level that prevailed also in the previous week. That rate is the highest recorded since the end of war a year ago.

Although railroad carloadings have been declining since the third week of July, the rate of steel ingot production has remained high in recent weeks, while electric power output and automobile assemblies have been climbing.

**AUTOS**—In its upward trend, auto production in the week ended Aug. 17 hit 91,620 units, highest since the second week of December, 1941.

**RAILROADS**—Although railroad carloadings have declined since the third week of July, the volume of freight traffic handled by Class I railroads in July totaled 52 billion ton-miles, compared with 50 billion in June. Compared with July, 1945, freight traffic handled in July, 1946, was off 8,720,580,000 ton-miles. For the first seven months of 1946 the ton-miles of revenue freight totaled 324,600,000,000, compared with 425,456,502,000 in the corresponding period of last year.

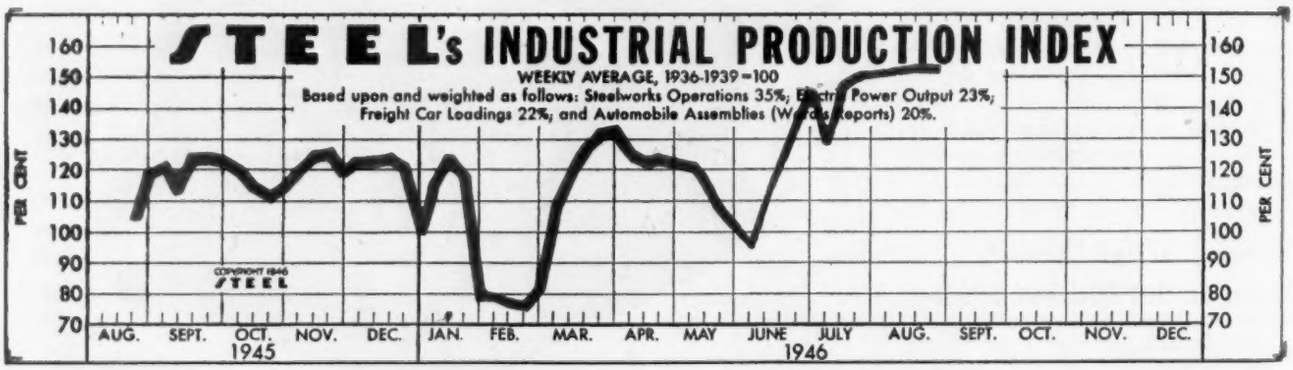
**STEEL**—Production of steel ingots has remained near 90 per cent of capacity for the past month and although the demand for steel is heavy it is unlikely that the rate will go much above the 90 mark because of a shortage of scrap and pig iron and because of the necessity of making furnace repairs that were delayed during the war period.

**COAL**—Output of bituminous coal is gradually overcoming the deficit incurred early this year during the miners' strike. Although production in the week ended Aug. 17 was only 11,980,000 tons whereas it was 12,300,000 tons in the previous week the total output this year through Aug. 17 had risen to within 14.6 per cent of the total for the corresponding period of 1945.

**PRICES**—The upward trend of prices continues, with a result that the U. S. Bureau of Labor Statistics index of wholesale prices in the week ended Aug. 17 rose to 128.3 per cent, up 1.2 points over the previous week.

**EARNINGS**—Hourly earnings in 25 manufacturing industries surveyed by the National Industrial Conference Board reached new peak levels in June. The average June hourly rate was $1.189, up 0.8 per cent over May. Weekly earnings in June averaged $46.78, an increase of 1.3 per cent over the previous month. Also up was employment, the June index being 3.1 per cent above May and almost up to the level prevailing when war ended in August, 1945.

**INVENTORIES**—Value of inventories held by manufacturers at the end of July was more than $600 million higher than June inventories, the rise being the sharpest monthly one on record. Preliminary figures from representative manufacturing firms showed inventories on July 31 were valued at nearly $18 billion, a record high.




**The Index (see chart above):** Latest Week (preliminary) 152 Previous Week 152 Month Ago 148

## FIGURES THIS WEEK

| INDUSTRY | Latest Period* | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Steel Ingot Output (per cent of capacity)‡ | 89 | 90 | 86.5 | 70 |
| Electric Power Distributed (million kilowatt hours) | 4,444 | 4,422 | 4,352 | 4,116 |
| Bituminous Coal Production (daily av.—1000 tons) | 1,997 | 2,050 | 2,058 | 1,032 |
| Petroleum Production (daily av.—1000 bbls.) | 4,836 | 4,843 | 4,926 | 4,892 |
| Construction Volume (ENR—Unit $1,000,000) | $97.0 | $129.1 | $140.9 | $23.0 |
| Automobile and Truck Output (Ward's—number units) | 91,620 | 88,990 | 84,720 | 14,880 |

*Dates on request. ‡1946 weekly capacity is 1,762,381 net tons. 1945 weekly capacity was 1,831,636 net tons.

| TRADE | | | | |
|---|---|---|---|---|
| Freight Carloadings (unit—1000 cars) | 880† | 888 | 911 | 853 |
| Business Failures (Dun & Bradstreet, number) | 17 | 17 | 13 | 16 |
| Money in Circulation (in millions of dollars)‡ | $28,365 | $28,353 | $28,187 | $27,506 |
| Department Store Sales (change from like week a year ago)‡ | +90% | +29% | +28% | −16% |

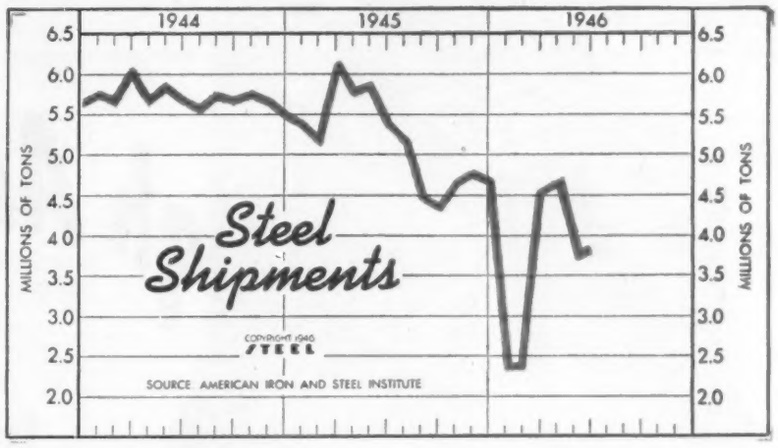
†Preliminary. ‡Federal Reserve Board.

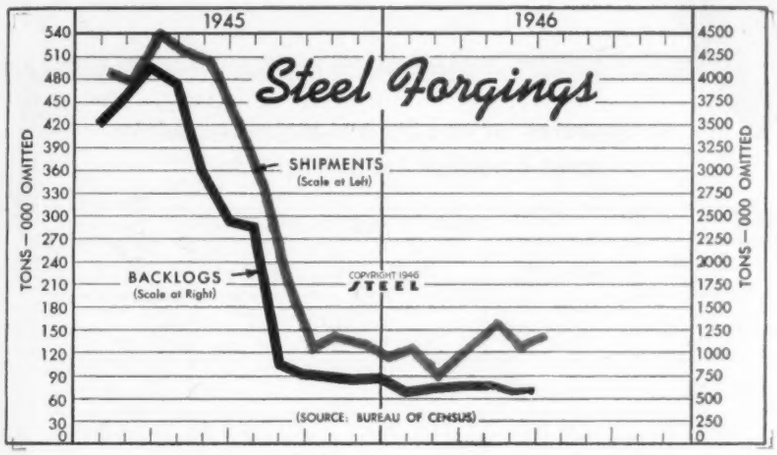
### Steel Shipments

(Net Tons)

| | 1946 | 1945 | 1944 |
|---|---|---|---|
| Jan. | 2,391,850* | 5,435,647 | 5,767,687 |
| Feb. | 2,391,849* | 5,184,498 | 5,700,673 |
| Mar. | 4,644,988 | 6,179,452 | 6,146,595 |
| Apr. | 4,698,081 | 5,769,786 | 5,744,177 |
| May | 3,906,064 | 5,938,055 | 5,859,786 |
| June | 3,966,628 | 5,437,206 | 5,703,314 |
| July | ..... | 5,214,074 | 5,597,631 |
| Aug. | ..... | 4,512,637 | 5,837,328 |
| Sept. | ..... | 4,391,143 | 5,743,437 |
| Oct. | ..... | 4,660,237 | 5,752,147 |
| Nov. | ..... | 4,779,628 | 5,686,527 |
| Dec. | ..... | 4,729,561 | 5,458,133 |

* Figures for January and February, 1946, are merely averages derived from a report that combined shipments for those two strike-affected months into a total of 4,783,699 tons.




### Steel Forgings

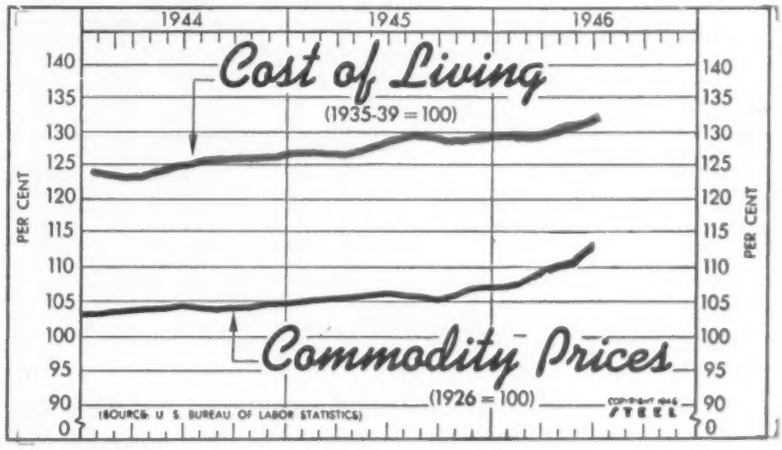
Tons—000 omitted

| | Shipments | | Unfilled orders* | | Consumption of steel | |
|---|---|---|---|---|---|---|
| | 1946 | 1945 | 1946 | 1945 | 1946 | 1945 |
| Jan. | 130 | 498 | 561 | 3,502 | 182 | 644 |
| Feb. | 93 | 483 | 596 | 3,826 | 125 | 628 |
| Mar. | 123 | 549 | 612 | 4,139 | 164 | 718 |
| Apr. | 155 | 524 | 604 | 3,961 | 208 | 666 |
| May | 139 | 510 | 599 | 2,989 | 197 | 655 |
| June | 147 | 430 | 610 | 2,420 | 204 | 548 |
| July | ... | 345 | ... | 2,356 | ... | 438 |
| Aug. | ... | 227 | ... | 841 | ... | 293 |
| Sept. | ... | 126 | ... | 745 | ... | 172 |
| Oct. | ... | 145 | ... | 735 | ... | 197 |
| Nov. | ... | 135 | ... | 708 | ... | 185 |
| Dec. | ... | 119 | ... | 724 | ... | 156 |

* Forgings for sale.

### Wholesale Commodity Price—Cost of Living Indexes

| | —Commodities— (1926=100) | | | —Living Cost— (1935-39=100) | | |
|---|---|---|---|---|---|---|
| | 1946 | 1945 | 1944 | 1946 | 1945 | 1944 |
| Jan. | 107.1 | 104.9 | 103.3 | 129.9 | 127.1 | 124.2 |
| Feb. | 107.7 | 105.2 | 103.6 | 129.6 | 126.9 | 123.8 |
| Mar. | 108.9 | 105.3 | 103.8 | 130.2 | 126.8 | 123.8 |
| Apr. | 110.2 | 105.7 | 103.9 | 131.1 | 127.1 | 124.6 |
| May | 111.0 | 106.0 | 104.0 | 131.7 | 128.1 | 125.1 |
| June | 112.9 | 106.1 | 104.3 | 133.3 | 129.0 | 125.4 |
| July | .... | 105.9 | 104.1 | .... | 129.4 | 126.1 |
| Aug. | .... | 105.7 | 103.9 | .... | 129.3 | 126.4 |
| Sept. | .... | 105.2 | 104.0 | .... | 128.9 | 126.5 |
| Oct. | .... | 105.9 | 104.1 | .... | 128.9 | 126.5 |
| Nov. | .... | 106.8 | 104.4 | .... | 129.3 | 126.6 |
| Dec. | .... | 107.1 | 104.7 | .... | 129.9 | 127.0 |
| Ave. | .... | 105.8 | 104.0 | .... | 128.4 | 125.5 |




## FINANCE

| | Latest Period* | Prior Week | Month Ago | Year Ago |
|---|---|---|---|---|
| Bank Clearings (Dun & Bradstreet—millions) | $12,163 | $11,100 | $12,342 | $9,023 |
| Federal Gross Debt (billions) | $267.7 | $267.7 | $268.3 | $263.2 |
| Bond Volume, NYSE (millions) | $17.0 | $17.4 | $19.4 | $42.9 |
| Stocks Sales, NYSE (thousands) | 4,506 | 3,747 | 5,426 | 5,736 |
| Loans and Investments (billions)† | $59.9 | $59.8 | $60.9 | $63.1 |
| United States Gov't. Obligations Held (millions)† | $41,460 | $41,454 | $42,643 | $46,770 |

†Member banks, Federal Reserve System.

## PRICES

| | | | | |
|---|---|---|---|---|
| STEEL's composite finished steel price average | $64.45 | $64.45 | $64.45 | $58.27 |
| All Commodities† | 128.3 | 127.1 | 124.2 | 105.5 |
| Industrial Raw Materials† | 146.3 | 145.7 | 141.4 | 116.9 |
| Manufactured Products† | 122.9 | 121.3 | 118.9 | 102.1 |

†Bureau of Labor Statistics Index, 1926 = 100.

# Weigh ALL the facts

## before you buy Insulating Firebrick

### Properties of the Johns-Manville Brick and Fireblok Insulation Line

| PROPERTIES | INSULATING BRICK | | | INSULATING FIREBRICK AND FIREBLOK | | | |
|---|---|---|---|---|---|---|---|
| | Sil-O-Cel Natural | Sil-O-Cel C-22 | Sil-O-Cel Super | JM-1620 | JM-20 | JM-23 | JM-26 |
| Density—lb. per cu. ft. | 30 | 38 | 40 | 29 | 35 | 42 | 48 |
| Transverse Strength—lb. per sq. in. | 140 | 115 | 90 | 60 | 80 | 120 | 125 |
| Cold Crushing Strength—lb. per sq. in. | 400 | 700 | 300 | 70 | 115 | 170 | 190 |
| Linear Shrinkage—Percent | 1.4 @ 1600F | 0.8 @ 2000F | 2.0 @ 2500F | 0.0 @ 2000F | 0.0 @ 2000F | 0.3 @ 2300F | 1.0 @ 2600F |
| Reversible Thermal Expansion—Percent | 0.1 @ 1600F | 0.7 @ 2000F | 1.3 @ 2000F | 0.5—0.6 @ 2000F | 0.5—0.6 @ 2000F | 0.5—0.6 @ 2000F | 0.5—0.6 @ 2000F |
| Conductivity at Mean Temperature | ∥ ⊥ | | | | | | |
| 500F | 1.01 .67 | 1.67 | 1.70 | .77 | .97 | 1.51 | 1.92 |
| 1000F | 1.13 .79 | 1.88 | 1.95 | 1.02 | 1.22 | 1.91 | 2.22 |
| 1500F | 1.24 .90 | 2.08 | 2.19 | 1.27 | 1.47 | 2.31 | 2.52 |
| 2000F | — — | — | 2.45 | — | 1.72 | 2.70 | 2.82 |
| Recommended Service | | | | | | | |
| Back Up | 1600F | 2000F | 2500F | 2000F | 2000F | 2300F | 2600F |
| Exposed | — | — | — | 1600F | 2000F | 2300F | 2600F |
| Recommended Mortar for Setting Brick | Sil-O-Cel Mortar | Sil-O-Cel Mortar | Sil-O-Cel Super Brick Mortar | J-M No. 1626 Cement | J-M No. 1626 Cement | J-M No. 1626 Cement | J-M No. 1626 Cement |

Note: 1. Above tests are in accordance with ASTM tentative standards.
2. Conductivity is expressed in Btu in. per hr per sq ft per deg F at the designated mean temperatures.
3. ∥ —with heat flow parallel to brick strata.
⊥ —with heat flow perpendicular to brick strata.

### In Insulating Firebrick, it's the correct BALANCE of thermal and physical PROPERTIES THAT COUNTS!

**AS THE CHART SHOWS YOU**—each of the seven types of J-M Insulating Brick and Insulating Firebrick is designed to do a special job . . . and do it well!

The three J-M Insulating Brick provide great structural strength, the four J-M Insulating Firebrick combine strength with exceptional resistance to spalling. All seven offer the advantages of light weight and low conductivity. They are recommended as back-up insulation or insulating firebrick for all industrial requirements.

For all the facts, write Johns-Manville, Box 290, N. Y. 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

## Johns-Manville *First in* Insulations

# Mills Expected To Open Books Soon for 1947

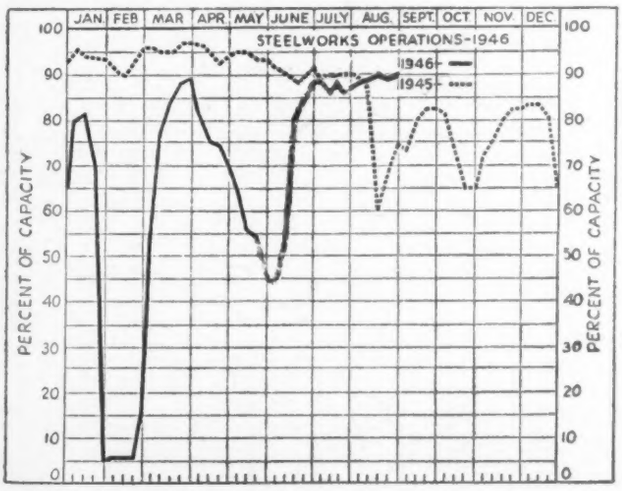
*Carryover and preferences to take up much capacity . . . Scrap price increase expected soon . . . Production holds high level*

FORMAL opening of books for first quarter of next year by some mills is expected during September, some as early as the middle of the month. Much will depend on how quickly mills can gage the volume of priority and directive tonnage for fourth quarter. This tonnage is beginning to be received and probably within a fortnight the greater part will have been specified.

Some producers of certain steel items already have accepted tonnage for next year but such action has been irregular and the exception to the general rule. In certain lines of pipe and tubing some producers have committed themselves far into the future. Producers of track accessories are booked well into next year and some plate mills have been accepting limited tonnages for first quarter. Some protections have been granted in various cases on steel required next year for identified projects and other scattered cases can be cited. However, in general, books have not yet been opened.

In many cass there will be a substantial carryover of 1946 commitments into next year. The outlook in that respect is not as bad as recently, as various mills, especially those on quarterly quota basis have been reducing allotments to consumers. Preference tonnage has been substantial but much of this has been scheduled at expense of customers unable to produce certificates.

In general strenuous efforts have been made to bring commitments and supply more into balance and it is believed they will be reflected by a smaller carryover at the end of this quarter than at the end of the preceding period. One large sheet producer has decided to issue no quotas on unrated tonnage for fourth quarter, putting all production into certified tonnage and arrearages, in the hope of reaching a reasonable balance by the end of the year.




**DISTRICT STEEL RATES**

(Percentage of Ingot Capacity Engaged in Leading Districts)

| | Week Ended Aug. 31 | Change | Same Week 1945 | Same Week 1944 |
|---|---|---|---|---|
| Pittsburgh | 96.5 | — 0.5 | 65 | 91 |
| Chicago | 92 | — 0.5 | 81 | 98.5 |
| Eastern Pa. | 83 | + 2 | 72 | 95 |
| Youngstown | 89 | + 1 | 76 | 93 |
| Wheeling | 89 | + 4 | 91 | 92 |
| Cleveland | 90 | None | 83.5 | 92 |
| Buffalo | 90.5 | + 4.5 | 65 | 90.5 |
| Birmingham | 93 | None | 95 | 95 |
| New England | 86 | None | 78 | 85 |
| Cincinnati | 84 | None | 80 | 92 |
| St. Louis | 54.5 | None | 65 | 87 |
| Detroit | 91 | + 5 | 89 | 89 |
| Estimated national rate | 90 | + 1 | 75 | 96.5 |

Based on weekly steelmaking capacity of 1,762,381 net tons for 1946; 1,831,636 tons for 1945; 1,791,287 tons for 1944.

A heavy load of preference work is indicated for fourth quarter, particularly in shapes, bars and sheets, more particularly galvanized sheets. Much of this will fall under CC ratings, especially for housing and agricultural needs, with probable continuation of export allotments in the final quarter, such as were set up for September, with the October distribution expected shortly, and special directives for other programs, such as 40,000 tons of 16-gage cold-rolled sheets for caskets for service men buried abroad, which is up for early action.

While orders carrying CC ratings are only now beginning to appear in volume, sellers assert that a number are from buyers not regular customers and they are not disposed to accept them unless instructed to do so by CPA. Tonnage already promised for fourth quarter is being applied against such rated orders as may come from customers to whom the promises were made.

Announcement of higher ceilings on prepared scrap are expected to be made by OPA soon, in accordance with recommendations of the industry advisory committee. The later has ruled against an increase on two previous occasions, with OPA following its advice. Release of hoarded scrap is expected to follow such an announcement. No definite price was recommended by the committee but it is believed the increase will be less than the $3.50 which has been urged.

Steelmaking operations hold close to the level of the past few weeks, the estimated national rate for last week being 90 per cent of capacity, a rise of 1 point. Pittsburgh dropped ½-point to 96½ per cent and Chicago ½-point to 92. Wheeling advanced 4 points to 89 per cent, Youngstown 1 points to 89, Detroit 5 points to 91, Buffalo 4½ points to 90½ and eastern Pennsylvania 2 points to 83. Rates were unchanged as follows: Cincinnati 84, Birmingham 93, New England 86, St. Louis 54½, Cleveland 90 and West Coast 84.

Pig iron production in July reached 4,705,277 net tons, largest output since July, 1945, when 4,801,467 tons were made. The July tonnage showed a gain of 1,023,004 tons over June's production of 3,682,273 tons.

# COMPOSITE MARKET AVERAGES

| | Aug. 31 | Aug. 24 | Aug. 17 | One Month Ago July, 1946 | Three Months Ago May, 1946 | One Year Ago Aug., 1945 | Five Years Ago Aug., 1941 |
|---|---|---|---|---|---|---|---|
| **Finished Steel** | $64.45 | $64.45 | $64.45 | $64.45 | $63.54 | $58.27 | $56.73 |
| **Semifinished Steel** | 40.60 | 40.60 | 40.60 | 40.60 | 40.60 | 37.80 | 36.00 |
| **Steelmaking Pig Iron** | 27.50 | 27.50 | 27.50 | 27.50 | 25.50 | 24.00 | 23.00 |
| **Steelmaking Scrap** | 19.17 | 19.17 | 19.17 | 19.17 | 19.17 | 19.17 | 19.17 |

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. Semifinished Steel Composite:—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. Steelmaking Pig Iron Composite:—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. Steelworks Scrap Composite:—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

# COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

## Finished Material

| | Aug. 31, 1946 | July, 1946 | May, 1946 | Aug., 1945 |
|---|---|---|---|---|
| Steel bars, Pittsburgh | 2.50c | 2.50c | 2.50c | 2.25c |
| Steel bars, Philadelphia | 2.86 | 2.86 | 2.82 | 2.57 |
| Steel bars, Chicago | 2.50 | 2.50 | 2.50 | 2.25 |
| Shapes, Pittsburgh | 2.35 | 2.35 | 2.35 | 2.10 |
| Shapes, Philadelphia | 2.48 | 2.48 | 2.465 | 2.215 |
| Shapes, Chicago | 2.35 | 2.35 | 2.35 | 2.10 |
| Plates, Pittsburgh | 2.50 | 2.50 | 2.50 | 2.25 |
| Plates, Philadelphia | 2.558 | 2.558 | 2.55 | 2.30 |
| Plates, Chicago | 2.50 | 2.50 | 2.50 | 2.25 |
| Sheets, hot rolled, Pittsburgh | 2.425 | 2.425 | 2.425 | 2.20 |
| Sheets, cold-rolled, Pittsburgh | 3.275 | 3.275 | 3.275 | 3.05 |
| Sheets, No. 24 galv., Pittsburgh | 4.05 | 4.05 | 4.05 | 3.70 |
| Sheets, hot-rolled, Gary | 2.425 | 2.425 | 2.425 | 2.20 |
| Sheets, cold-rolled, Gary | 3.275 | 3.275 | 3.275 | 3.05 |
| Sheets, No. 24 galv., Gary | 4.05 | 4.05 | 4.05 | 3.70 |
| Hot-rolled strip, over 6 to 12-in., Pitts. | 2.35 | 2.35 | 2.35 | 2.10 |
| Cold-rolled strip, Pittsburgh | 3.05 | 3.05 | 3.05 | 2.80 |
| Bright basic, bess. wire, Pittsburgh | 3.05 | 3.05 | 3.05 | 2.75 |
| Wire nails, Pittsburgh | 3.75 | 3.75 | 3.25 | 2.90 |
| Tin plate, per base box, Pittsburgh | $5.25 | $5.25 | $5.25 | $5.00 |

## Semifinished Material

| | | | | |
|---|---|---|---|---|
| Sheet bars, Pittsburgh, Chicago | $38.00 | $38.00 | $38.00 | $36.00 |
| Slabs, Pittsburgh, Chicago | 39.00 | 39.00 | 39.00 | 36.00 |
| Rerolling billets, Pittsburgh | 39.00 | 39.00 | 39.00 | 36.00 |
| Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts. | 2.30c | 2.30c | 2.30c | 2.15c |

## Pig Iron

| | Aug. 31, 1946 | June, 1946 | Apr., 1946 | July, 1945 |
|---|---|---|---|---|
| Bessemer del. Pittsburgh | $29.77 | $29.69 | $27.69 | $26.19 |
| Basic, Valley | 28.00 | 28.00 | 26.00 | 24.50 |
| Basic, eastern del. Philadelphia | 29.93 | 29.93 | 27.84 | 26.34 |
| No. 2 fdry., del. Pgh. N. & S. sides | 29.27 | 29.19 | 27.19 | 25.69 |
| No. 2 foundry, Chicago | 28.50 | 28.50 | 26.50 | 25.00 |
| Southern No. 2, Birmingham | 24.88 | 24.88 | 22.88 | 21.38 |
| Southern No. 2 del. Cincinnati | 28.94 | 28.94 | 26.94 | 25.44 |
| No. 2 fdry., del. Philadelphia | 30.43 | 30.43 | 28.34 | 26.84 |
| Malleable, Valley | 28.50 | 28.50 | 26.50 | 25.00 |
| Malleable, Chicago | 28.50 | 28.50 | 26.50 | 25.00 |
| Charcoal, low phos., fob Lyles, Tenn. | 33.00 | 33.00 | 33.00 | 33.00 |
| Gray forge, del. Pittsburgh | 28.69 | 28.69 | 26.69 | 25.19 |
| Ferromanganese, fob cars, Pittsburgh | 140.00 | 140.00 | 140.00 | 140.33 |

## Scrap

| | | | | |
|---|---|---|---|---|
| Heavy melting steel, No. 1, Pittsburgh | $20.00 | $20.00 | $20.00 | $20.00 |
| Heavy melt, steel, No. 2, E. Pa. | 18.75 | 18.75 | 18.75 | 18.75 |
| Heavy melting steel, Chicago | 18.75 | 18.75 | 18.75 | 18.75 |
| Rails for rolling, Chicago | 22.25 | 22.25 | 22.25 | 22.25 |
| No. 1 cast, Chicago | 20.00 | 20.00 | 20.00 | 20.00 |

## Coke

| | | | | |
|---|---|---|---|---|
| Connellsville, furnace ovens | $8.75 | $8.75 | $7.50 | $7.50 |
| Connellsville, foundry ovens | 9.87½ | 9.50 | 8.25 | 8.25 |
| Chicago, by-product fdry., del. | 15.10 | 15.10 | 13.75 | 13.67 |

# STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

**Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Delivered prices do not include the 3 per cent federal tax on freight. Pricing on rails was changed to net ton basis as of Feb. 15, 1946.**

## Semifinished Steel

**Carbon Steel Ingots:** Fob mill base, rerolling quality, standard analysis, $33.

**Alloy Steel Ingots:** Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon; uncrop, $48.69.

**Rerolling, Billets, Blooms, Slabs:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Sparrows Point, Birmingham, Youngstown, $39; Detroit, del., $41; Duluth (billets), $41; Pac. ports (billets), $51. (Andrews Steel Co., carbon slabs, $41; Northwestern Steel & Wire Co., $41, Sterling, Ill.; Granite City Steel Co., $47.50 gross tons slabs from D.P.C. mill. Geneva Steel Co., $58.64, Pac. ports.)

**Forging Quality Blooms, Slabs, Billets:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $47; Detroit, del., $49; Duluth, billets, $49; forging billets fob Pac. ports, $59.

(Andrews Steel Co. may quote carbon forging billets $50 gross ton at established basing points; Follansbee Steel Corp., $49.50 fob Toronto, O.; Geneva Steel Co., $64.64, Pacific ports.)

**Alloy Billets, Slabs, Blooms:** Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $58.43; del. Detroit $60.43; eastern Mich. $61.43.

**Sheet Bars:** Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $38. (Empire Sheet & Tin Plate Co., Mansfield, O., carbon sheet bars, $39, fob mill.)

**Skelp:** Pittsburgh, Chicago, Sparrows Point, Youngstown, Coatesville, lb, 2.05c.

**Wire Rods:** Pittsburgh, Chicago, Cleveland, Birmingham, No. 5—$\frac{9}{32}$ in. inclusive, per 100 lb, $2.30. Do., over $\frac{9}{32}$—$\frac{47}{64}$-in., incl., $2.45; Galveston, base, $2.40 and $2.55, respectively. Worcester add $0.10; Pacific ports $0.50.

## Bars

**Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.:** Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham base, 20 tons one size, 2.50c; Duluth, base, 2.60c; Detroit, del., 2.60c; eastern Mich., 2.65c; New York, del., 2.86c; Phila., del., 2.86c; Gulf ports, dock, 2.85c; Pac., ports, dock, 3.15c. (Sheffield Steel Corp. may quote 2.75c, fob St. Louis; Josiyn Mfg. & Supply Co., 2.55c, fob Chicago.)

**Rail Steel Bars:** Same prices as for hot-rolled carbon cars except base is 5 tons.

**Hot-Rolled Alloy Bars:** Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 2.921c; Detroit, del., 3.021c. (Texas Steel Co. may use Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

| AISI Series | (*Basic O-H) | AISI Series | (*Basic O-H) |
|---|---|---|---|
| 1300 | $0.108 | 4300 | $1.839 |
| 2300 | 1.839 | 4600 | 1.298 |
| 2500 | 2.759 | 4800 | 2.326 |
| 3000 | 0.541 | 5100 | 0.379 |
| 3100 | 0.920 | 5130 or 5152 | 0.494 |
| 3200 | 1.461 | 6120 or 6152 | 1.028 |
| | | 6145 or 6150 | 1.298 |
| 3400 | 3.462 | 8612 | 0.703 |
| 4000 | 0.487 | 8720 | 0.757 |
| 4100 (.15-.25 Mo) | 0.757 | 9830 | 1.407 |
| (.20-.30 Mo) | 0.812 | | |

* Add 0.25 for acid open-hearth; 0.50 electric.

**Cold-Finished Carbon Bars:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 20,000-39,999 lb, 3.10c; Detroit, 3.15c; Toledo, 3.25c.

**Cold-Finished Alloy Bars:** Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base, 3.625c; Detroit, del., 3.725c, eastern Mich., 3.755c.

**Reinforcing Bars (New Billet):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, 2.50c; Gulf ports, dock, 2.70c; Pacific ports, dock, 2.75c.

**Reinforcing Bars (Rail Steel):** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo, base, 2.35c; Detroit, del., 2.45c; eastern Mich. and Toledo, del., 2.50c; Gulf ports, dock, 2.70c.

**Iron Bars:** Single refined, Pitts., 4.76c; double refined, 5.84c; Pittsburgh, staybolt, 6.20c; Terre Haute, single ref., 5.42c; double ref., 6.76c.

## Sheets, Strip

**Hot-Rolled Sheets:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Pt., Middletown, base, 2.425c; Granite City, base, 2.525c; Detroit, del., 2.525c; eastern Mich., del., 2.575c; Phila., del., 2.615c; New York, del., 2.685c; Pacific ports, 2.975c. (Andrews Steel Co. may quote hot-rolled sheets for shipment to the Detroit area on the Middletown, O., base; Alan Wood Steel Co., Conshohocken, Pa., may quote 3.00c on hot carbon sheets, Sparrows Point, Md.)

**Cold-Rolled Sheets:** Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.275c; Granite City, base, 3.375c; Detroit, del., 3.375c; eastern Mich., del., 3.425c; New York, del., 3.615c; Phila., del., 3.635c; Pacific ports, 3.925c.

**Galvanized Sheets, No. 24:** Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base, 4.05c; Granite City, base, 4.15c; New York, del., 4.31c; Phila., del., 4.24c; Pacific ports, 4.60c.

**Corrugated Galv. Sheets:** Pittsburgh, Chicago, Gary, Birmingham, 29-gage, per square, 3.73c.

**Culvert Sheets:** Pittsburgh, Chicago, Gary, Birmingham, 16-gage not corrugated, copper alloy, 4.15c; Granite City, 4.25c; Pacific ports, 4.60c; copper iron, 4.50c; pure iron, 4.50c; zinc-coated, hot-dipped, heat-treated, No. 24, Pittsburgh, 4.60c.

**Aluminized Sheets, 20 gage:** Pittsburgh, hot-dipped, coils or cut to lengths, 9.00c.

**Enameling Sheets:** 10-gage; Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base 3.20c; Granite City, base 3.30c; Detroit, del., 3.30c; eastern Mich., 3.35c; Pacific ports, 3.85c; 20-gage: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, base, 3.80c; Detroit, del., 3.90c; eastern Mich., 3.95c; Pacific ports, 4.45c.

**Electrical Sheets No. 24:**

| | Pittsburgh Base | Pacific Ports | Granite City |
|---|---|---|---|
| Field grade | 3.90c | 4.65c | 4.00c |
| Armature | 4.25c | 5.00c | 4.35c |
| Electrical | 4.75c | 5.50c | 4.85c |
| Motor | 5.425c | 6.175c | 5.525c |
| Dynamo | 6.125c | 6.875c | 6.225c |
| Transformer | | | |
| 72 | 6.625c | 7.375c | ..... |
| 65 | 7.625c | 8.375c | ..... |
| 58 | 8.125c | 8.875c | ..... |
| 52 | 8.925c | 9.675c | ..... |

**Hot-Rolled Strip:** Pittsburgh, Chicago, Gary Cleveland, Birmingham, Youngstown, Middletown, 6-in. and narrower: Base, 2.45c; Detroit, del., 2.55c; eastern Mich., del., 2.60c; Pacific ports, 3.10c. (Superior Steel Corp. may quote 3.30c, Pitts.)

Over 6-in.: Base, 2.35c; Detroit, del., 2.45c; eastern Mich., del., 2.50c; Pacific ports, 3.00c. (Superior Steel Corp. may quote 3.20c, Pitts.)

**Cold-Rolled Strip:** Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less, 3.05c; Chicago, base, 3.15c; Detroit, del., 3.15c; eastern Mich., del., 3.20c; Worcester, base, 3.25c. (Superior Steel Corp. may quote 4.70c, Pitts.)

**Cold-Finished Spring Steel:** Pittsburgh, Cleveland base, 0.26-0.50 carbon, 3.03c. Add 0.20c for Worcester.

## Tin, Terne Plate

(OPA ceiling prices announced March 1, 1946.)

**Tin Plate:** Pittsburgh, Chicago, Gary, 100-lb base box, $5.25; Granite City, Birmingham, Sparrows Point, $5.35.

**Electrolytic Tin Plate:** Pittsburgh, Gary, 100-lb base box, 0.25 lb tin, $4.60; 0.50 lb tin, $4.75; 0.75 lb tin, $4.90; Granite City, Birmingham, Sparrows Point, $4.70, $4.85, $5.00, respectively.

**Tin Mill Black Plate:** Pittsburgh, Chicago, Gary, base 29-gage and lighter, 3.30c; Granite City, Birmingham, Sparrows Point, 3.40c; Pacific ports, boxed, 4.30c.

**Long Ternes:** Pittsburgh, Chicago, Gary, No. 24 unassorted, 4.05c; Pacific ports, 4.80c.

**Manufacturing Ternes (Special Coated):** Pittsburgh, Chicago, Gary, 100-base box, $4.55; Granite City, Birmingham, Sparrows Point; $4.65.

**Roofing Ternes:** Pittsburgh base per package 112 sheets; 20 x 28 in., coating I. C. 8-lb $12.50; 15-lb $14.50; 20-lb $15.50 (nom.); 40-lb $20.00 (nom.)

## Plates

**Carbon Steel Plates:** Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, Coatesville, Claymont, 2.50c; New York, del., 2.71c; Phila., del., 2.558c; St. Louis, 2.74c; Boston, del., 2.86c; Pacific ports, 3.05c; Gulf ports, 2.85c.

(Granite City Steel Co. may quote carbon plates 2.65c fob D.P.C. mill; Geneva Steel Co., Provo, Utah, 3.20c fob Pac. ports; Central Iron & Steel Co., Harrisburg, Pa., 2.80c, basing points; Lukens Steel Co., Coatesville, Pa., 2.75c, base; Worth Steel Co., Claymont, Del., 2.60c, base; Alan Wood Steel Co., Conshohocken, Pa., 2.75c base.)

**Floor Plates:** Pittsburgh, Chicago, 3.75c; Pacific ports, 4.40c; Gulf ports, 4.10c.

**Open-Hearth Alloy Plates:** Pittsburgh, Chicago, Coatesville, 3.787c; Gulf ports, 4.273c; Pacific ports, 4.49c.

**Clad Steel Plates:** Coatesville, 10% cladding: nickel-clad, 18.72c; inconel-clad, 26.00c; monel-clad, 24.96c.

## Shapes

**Structural Shapes:** Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.35c; New York, del., 2.54c; Phila., del., 2.48c; Pacific ports, 3.00c; Gulf ports, 2.70c.

(Phoenix Iron Co., Phoenixville, Pa., may quote the equivalent of 2.60c, Bethlehem, Pa., on the general range and 2.70c on beams and channels from 4 to 10 inches.)

**Steel Piling:** Pittsburgh, Chicago, Buffalo, 2.65c; Pacific ports, 3.20c.

## Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham, per 100 pounds)

**Wire to Manufacturers in carloads**

| | |
|---|---|
| Bright basic or bessemer | *$3.05 |
| Spring (except Birmingham) | *$4.00 |

**Wire Products to Trade**

**Nails and staples**

| | |
|---|---|
| Standard and cement-coated | †$3.75 |
| Galvanized | ‡$3.40 |

**Wire,** Merchant Quality

| | |
|---|---|
| Annealed | §$3.50 |
| Galvanized | §$3.85 |

(Fob Pittsburgh, Chicago, Cleveland, Birmingham, per base column)

| | |
|---|---|
| **Woven fence,** 15½ gage and heavier | 72 |
| **Barbed wire,** 80-rod spool | **79 |
| **Barbless wire,** twisted | **79 |
| **Fence posts** | 74 |
| **Bale ties,** single loop | 72½ |

*Add $0.10 for Worcester, $0.05 for Duluth and $0.50 for Pacific ports.

†Add $0.30 for Worcester, $0.50 for Pacific ports. Nichols Wire & Steel may quote $4.25; Pittsburgh Steel Co., $4.10.

‡Add $0.50 for Pacific ports.

§Add $0.10 for Worcester; $0.70 Pacific ports.

**Pittsburgh Steel Co. may quote 89.

## Tubular Goods

**Welded Pipe:** Base price in carloads, threaded and coupled to consumers about $200 per net ton. Base discounts on steel pipe Pittsburgh and Lorain, O.; Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Pittsburgh base only on wrought iron pipe.

**Butt Weld**

| | Steel | | | Iron | |
|---|---|---|---|---|---|
| In. | Blk. | Galv. | In. | Blk. | Galv. |
| ⅛ | 53 | 30 | ¼ | 21 | 0½ |
| ¼ & ⅜ | 56 | 37½ | ⅜ | 27 | 7 |
| ½ | 60½ | 48 | 1-1¼ | 31 | 13 |
| ¾ | 63½ | 52 | 1½ | 35 | 15½ |
| 1-3 | 65½ | 54½ | 2 | 34½ | 15 |

**Lap Weld**

| | Steel | | | Iron | |
|---|---|---|---|---|---|
| In. | Blk. | Galv. | In. | Blk. | Galv. |
| 2 | 58 | 46½ | 1¼ | 20 | 0½ |
| 2½-3 | 61 | 49½ | 1½ | 25½ | 7 |
| 3½-6 | 63 | 51½ | 2 | 27½ | 9 |
| 7-8 | 62 | 49½ | 2½-3½ | 28½ | 11½ |
| 9-10 | 61½ | 49 | 4 | 30½ | 15 |
| 11-12 | 60½ | 48 | 4½-8 | 29½ | 14 |
| | | | 9-12 | 25½ | 9 |

| | —Seamless— | | —Elec. Weld— | |
|---|---|---|---|---|
| O.D. sizes | B.W.G. | Hot Rolled | Cold Drawn | Hot Rolled | Cold Rolled |
| 1" | 13 | ..... | $9.90 | $9.36 | $9.65 |
| 1¼" | 13 | ..... | 11.73 | 9.63 | 11.43 |
| 1½" | 13 | $10.91 | 12.96 | 10.63 | 12.64 |
| 1¾" | 13 | 12.41 | 14.75 | 12.10 | 14.37 |
| 2" | 13 | 13.90 | 16.52 | 13.53 | 16.19 |
| 2¼" | 13 | 15.50 | 18.42 | 15.06 | 18.03 |
| 2¼" | 12 | 17.07 | 20.28 | 16.57 | 19.83 |
| 2½" | 12 | 18.70 | 22.21 | 18.11 | 21.68 |
| 2¾" | 12 | 19.82 | 23.54 | 19.17 | 22.95 |
| 3" | 12 | 20.79 | 24.71 | 20.05 | 24.02 |
| 3½" | 11 | 26.24 | 31.18 | 25.30 | 30.29 |
| 4" | 10 | 32.56 | 38.68 | 31.32 | 37.52 |
| 4½" | 9 | 43.16 | 51.29 | ..... | ..... |
| 5" | 9 | 49.96 | 59.36 | ..... | ..... |
| 6" | 7 | 76.71 | 91.14 | ..... | ..... |

**Boiler Tubes:** Net base prices per 100 feet fob Pittsburgh in carload lots, minimum wall, cut lengths 4 to 24 feet, inclusive.

**Pipe, Cast Iron:** Class B, 6-in. and over, $60 per net ton, Birmingham; $65, Burlington, N. J.; $62.80, del., Chicago; 4-in. pipe, $5 higher. Class A pipe, $3 a ton over class B.

## Rails, Supplies

Standard rails, over 60-lb, fob mill, net ton, $43.40. Light rails (billet), Pittsburgh, Chicago, Birmingham, net ton, $49.18.

Relaying rails, 35 lb and over, fob railroad and basing points, $31-$33.

Supplies: Track bolts, 6.50c; heat treated, 6.75c. Tie plates $51 net ton, base, Standard spikes, 3.65c.

## Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago. Additional discounts: 5 for carloads; 10 for full containers, except tire, step and plow bolts.

(Ceiling prices advanced 12 per cent, effective July 27, 1946; discounts remain unchanged.)

**Carriage and Machine**

| | |
|---|---|
| ½ x 6 and smaller | 65½ off |
| Do., ⅞ and ⅝ x 6-in. and shorter | 63½ off |
| Do., ¾ to 1 x 6-in. and shorter | 61 off |
| 1⅛ and larger, all lengths | 59 off |
| All diameters, over 6-in. long | 59 off |
| Tire bolts | 50 off |
| Step bolts | 56 off |
| Plow bolts | 65 off |

**Stove Bolts**

In packages, nuts separate, 71-10 off, nuts attached, 71 off; bulk, 80 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

**Nuts**

| Semifinished hex | U.S.S. | S.A.E. |
|---|---|---|
| ⅞-in. and smaller | .. | 64 |
| ½-in. and smaller | 62 | .. |
| ½-in.-1-in. | .. | 60 |
| ⅞-in.-1-in. | 59 | .. |
| 1⅛-in.-1½-in. | 57 | 58 |
| 1⅝-in. and larger | 56 | .. |

Additional discount of 10 for full kegs.

**Hexagon Cap Screws**

| | |
|---|---|
| Upset 1-in., smaller | 64 off |
| Milled 1-in., smaller | 60 off |

**Square Head Set Screws**

| | |
|---|---|
| Upset 1-in. and smaller | 71 off |
| Headless, ¼-in. and larger | 60 off |
| No. 10 and smaller | 70 off |

## Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

| | |
|---|---|
| Structural | 4.75c |
| ⅞-inch and under | *65-5 off |

*Plus 12 per cent increase on base prices, effective July 26.

## Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $2.75-$3.00 off

## Tool Steels

**Tool Steels:** Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 15.15c; extra carbon 19.48c; special carbon 23.80c; oil-hardening 25.97c; high carbon-chromium 46.53c.

| W | Cr. | V. | Mo. | Base, per lb. |
|---|---|---|---|---|
| 18.00 | 4 | 1 | ... | 72.49c |
| 1.5 | 4 | 1 | 8.5 | 58.43c |
| ... | 4 | 2 | 3 | 58.43c |
| 6.40 | 4.15 | 1.90 | 5 | 62.22c |
| 5.50 | 4.50 | 4 | 4.50 | 75.74c |

## Stainless Steels

Base, Cents per lb

**CHROMIUM NICKEL STEELS**

| | Bars | Plates | Sheets | H.R. Strip | C.R. Strip |
|---|---|---|---|---|---|
| 302 | 25.96c | 29.21c | 36.79c | 23.93c | 30.30c |
| 303 | 28.13 | 31.38 | 38.95 | 29.21 | 35.71 |
| 304 | 27.05 | 31.38 | 38.95 | 25.45 | 32.46 |
| 308 | 31.38 | 36.79 | 44.36 | 30.84 | 37.87 |
| 309 | 38.95 | 43.28 | 50.85 | 40.03 | 50.85 |
| 310 | 53.02 | 56.26 | 57.35 | 52.74 | 60.59 |
| 312 | 38.95 | 43.28 | 53.02 | ..... | ..... |
| *316 | 43.28 | 47.61 | 51.94 | 43.28 | 51.94 |
| ‡321 | 31.38 | 36.79 | 44.36 | 31.65 | 41.12 |
| †347 | 35.71 | 41.12 | 48.69 | 35.71 | 45.44 |
| 431 | 20.56 | 23.80 | 31.38 | 18.94 | 24.35 |

**STRAIGHT CHROMIUM STEEL**

| | | | | | |
|---|---|---|---|---|---|
| 403 | 23.93 | 26.51 | 31.92 | 22.99 | 29.21 |
| **410 | 20.02 | 23.93 | 28.67 | 18.39 | 23.80 |
| 416 | 20.56 | 23.80 | 29.21 | 19.75 | 25.45 |
| ††420 | 25.96 | 30.84 | 36.25 | 25.70 | 39.49 |
| 430 | 20.56 | 23.80 | 31.38 | 18.94 | 24.35 |
| ‡‡430F | 21.10 | 24.35 | 31.92 | 20.29 | 26.51 |
| 440A | 25.96 | 30.84 | 36.25 | 25.70 | 39.49 |
| 442 | 24.35 | 27.59 | 35.17 | 25.96 | 34.62 |
| 443 | 24.35 | 27.59 | 35.17 | 25.96 | 34.62 |
| 446 | 29.76 | 33.00 | 39.49 | 37.87 | 56.26 |
| 501 | 8.66 | 12.98 | 17.04 | 12.98 | 18.39 |
| 502 | 9.74 | 14.07 | 18.12 | 14.07 | 19.48 |

**STAINLESS CLAD STEEL (20%)**

(Fob Pittsburgh and Washington, Pa., plate prices include annealing and pickling.)

| | | | | |
|---|---|---|---|---|
| 304 | 19.48 | 20.56 | ..... | ..... |
| 410 | 17.31 | 18.39 | ..... | ..... |
| 430 | 17.85 | 18.94 | ..... | ..... |
| 446 | 19.48 | 20.56 | ..... | ..... |

* With 2-3% molybdenum. § With titanium. † With columbium. ** Plus machining agent †† High carbon. ‡‡ Free machining.

## Metallurgical Coke

Price Per Net Ton

**Beehive Ovens**

| | |
|---|---|
| Connellsville, furnace | $6.75 |
| Connellsville, foundry | 9.75-10.00 |
| New River, foundry | 10.25-10.50 |
| Wise county, foundry | 9.00- 9.50 |
| Wise county, furnace | 8.50- 9.00 |

**By-Product Foundry**

| | |
|---|---|
| Kearney, N. J., ovens | 14.40 |
| Chicago, outside delivered | 14.35 |
| Chicago, delivered | 15.10 |
| Terre Haute, delivered | 14.85 |
| Milwaukee, ovens | 15.10 |
| New England, delivered | 16.00 |
| St. Louis, delivered | †15.10 |
| Birmingham, delivered | 12.25 |
| Indianapolis, delivered | 14.85 |
| Cincinnati, delivered | 14.60 |
| Cleveland, delivered | 14.55 |
| Buffalo delivered | 14.75 |
| Detroit, delivered | 15.10 |
| Philadelphia, delivered | 14.60 |

*Operators of hand-drawn ovens using trucked coal may charge $9.35; retroactive to May 17, 1946, on adjustable pricing.

†15.68 from other than Ala., Mo., Tenn.

## Coke By-Products

| | |
|---|---|
| Spot, gal, freight allowed east of Omaha | |
| Pure and 90% benzol | 15.00¢ |
| Toluol, two degree | 22.00¢ |
| Industrial xylol | 22.00¢ |
| Per pound fob works | |
| Phenol (car lots, returnable drums) | 11.25¢ |
| Do., less than carlots | 12.00¢ |
| Do., tank cars | 10.25¢ |
| Eastern plants, per pound | |
| Naphthalene flakes, balls, bbl, to jobbers, "household use" | 9.00¢ |
| Per ton, bulk, fob plants | |
| Sulphate of ammonia | $30.00 |

# WAREHOUSE STEEL PRICES

Base delivered price, cents per pound, for delivery within switching limits, subject to established extras. Quotations based on mill prices announced March 1, 1946

| | Hot-rolled bars | Structural shapes | Plates | Floor plates | Hot-rolled sheets (10-gage base) | Hot-rolled strip (14-gage and lighter, 6-in and narrower) | Hot-rolled strip (12-gage and heavier wider than 6-inch) | Galvanized flat sheets (24-gage base) | Cold-rolled sheets (17-gage base) | Cold-finished bars | Cold-rolled strip |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Boston | 4.356[1] | 4.203[1] | 4.203[1] | 6.039[1] | 4.050[1] | 5.548[1] | 4.418[1] | 5.725[14] | 5.031[14] | 4.656[25] | 4.965 |
| New York | 4.134[1] | 4.038[1] | 4.049[1] | 5.875[1] | 3.856[1] | 4.375[1] | 4.275[1] | 5.501[13] | 4.838[14] | 4.584[25] | 5.075 |
| Jersey City | 4.155[1] | 4.018[1] | 4.049[1] | 5.875[1] | 3.856[1] | 4.375[1] | 4.275[1] | 5.501[13] | 4.890[14] | 4.605[25] | 5.075 |
| Philadelphia | 4.114[1] | 3.937[1] | 3.875[1] | 5.564[1] | 3.774[1] | 4.664[1] | 4.554[1] | 5.499[13] | 5.139[26] | 4.564[25] | 5.064 |
| Baltimore | 4.093[1] | 4.05[1] | 3.865[1] | 5.543[1] | 3.64[1] | 4.293[1] | 4.193[1] | 5.365[17] | 5.118[26] | 4.543[25] | .... |
| Washington | 4.232[1] | 4.22[1] | 4.067[1] | 5.632[1] | 3.842[1] | 4.432[1] | 4.332[1] | 5.667[17] | 5.007[24] | 4.532[25] | .... |
| Norfolk, Va. | 4.377[1] | 4.303[1] | 4.262[1] | 5.777[1] | 4.037[1] | 4.927[1] | 4.477[1] | 5.862[17] | 4.552[24] | 4.677[25] | .... |
| Bethlehem, Pa.* | .... | 3.70[1] | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Claymont, Del.* | .... | .... | 3.70[1] | .... | .... | .... | .... | .... | .... | .... | .... |
| Coatesville, Pa.* | .... | .... | 3.70[1] | .... | .... | .... | .... | .... | .... | .... | .... |
| Buffalo (city) | 3.60[1] | 3.65[1] | 3.92[1] | 5.55[1] | 3.575[1] | 4.21[1] | 4.11[1] | 5.20[13] | 4.625[16] | 4.20[25] | 4.96 |
| Buffalo (country) | 3.50[1] | 3.55[1] | 3.55[1] | 5.15[1] | 3.475[1] | 3.85[1] | 3 750[1] | 5.10[13] | 4.525[16] | 4.10[25] | 4 60 |
| Pittsburgh (city) | 3.60[1] | 3.65[1] | 3.65[1] | 5.25[1] | 3.575[1] | 3.95[1] | 3.850[1] | 5.327[13] | 4.625[24] | 4.20[25] | 4.70 |
| Pittsburgh (country) | 3.50[1] | 3.55[1] | 3.55[1] | 5.15[1] | 3.475[1] | 3.85[1] | 3.750[1] | 5.10[13] | 4.525[24] | 4.10[25] | 4.60 |
| Cleveland (city) | 3.60[1] | 3.88[1] | 3.65[1] | 5.48[1] | 3.575[1] | 3 95[1] | 3.850[1] | 5.347[13] | 4.625[24] | 4.20[25] | 4.70 |
| Cleveland (country) | 3.50[1] | .... | 3.55[1] | .... | 3.475[1] | 3.85[1] | 3.750[1] | .... | 4.525[24] | 4.10[25] | 4.60 |
| Detroit | 3.70[1] | 3.952[1] | 3.90[1] | 5.572[1] | 3.675[1] | 4.050[1] | 3.950[1] | 5.491[13] | 4.725[24] | 4.25[13] | 4.95 |
| Omaha (city, del.) | 4.32[1] | 4.37[1] | 4.37[1] | 5.97[1] | 4.045[1] | 4.52[1] | 4.42[1] | 6.00[13] | 5.72[24] | 4.945[25] | .... |
| Omaha (country) | 4.22[1] | 4.27[1] | 4.27[1] | 5.87[1] | 3.945[1] | 4.42[1] | 4.32[1] | 5.90[13] | .... | .... | .... |
| Cincinnati | 3.902[1] | 3.983[1] | 3.952[1] | 5.583[1] | 3.671[1] | 4.046[1] | 3.946[1] | 5.296[13] | 4.271[24] | 4.602[25] | .... |
| Youngstown* | .... | .... | .... | .... | .... | .... | .... | 4.85[13] | .... | .... | .... |
| Middletown, O.* | .... | .... | .... | .... | 3.475[3] | 3.95[1] | 3.750[1] | 5 10[13] | .... | .... | .... |
| Chicago (city) | 3.75[1] | 3.80[1] | 3.80[1] | 5.40[1] | 3.475[1] | 3.95[1] | 3.850[1] | †5.40[13] | 4.425[24] | 4.20[25] | 4.90 |
| Milwaukee | 3.908[1] | 3.958[1] | 3.958[1] | 5.558[1] | 3.633[1] | 4.108[1] | 4.008[1] | †5.558[13] | 4.583[24] | 4.358[25] | 5.058 |
| Indianapolis | 3.83[1] | 3.88[1] | 3.88[1] | 5.48[1] | 3.743[1] | 4.118[1] | 4.018[1] | 5.368[13] | 4.793[24] | 4.43[25] | 5.080 |
| St. Paul | 4.092[3] | 4.142[3] | 4 142[3] | 5.742[3] | 3.817[3] | 4.292[3] | 4.192[3] | 5.666[13] | 4.767[24] | 4.852[25] | 5 398 |
| St. Louis | 3.918[1] | 3.968[1] | 3.968[1] | 5.568[1] | 3.643[1] | 4.118[1] | 4.018[1] | 5.622[13] | 4.593[24] | 4.522[25] | 5.222 |
| Memphis, Tenn. | 4.296[1] | 4.346[1] | 4.346[1] | 6.071[1] | 4.221[1] | 4.596[1] | 4.496[1] | 5.746[13] | .... | 4.821[25] | .... |
| Birmingham | 3.75[1] | 3.80[1] | 3.80[1] | 6.153[1] | 3.675[1] | 4.05[1] | 4.05[1] | 5.20[13] | 5.077[24] | 4.99[25] | 5.465 |
| New Orleans (city) | 4.358[1] | 4.408[1] | 4.408[1] | 6.329[1] | 4.283[1] | 4.658[1] | .... | 5.808[13] | 5.304[24] | 5.079[25] | .... |
| Houston, Tex. | 4.00[1] | 4.50[1] | 4.50[1] | 5.75[3] | 3.988[3] | 4.668[3] | 4.568[3] | 5.763[24] | 5.819[26] | 4.10[25] | .... |
| Los Angeles | 4.65[4] | 4.90[4] | 5.20[4] | 7.45[4] | 5.225[4] | 5.30[4] | 5.200[4] | 6.55[13] | 7.425[4] | 6.033[25] | 5.863 |
| San Francisco | 4.20[7] | 4.15[7] | 4.15[7] | 5.85[7] | 4.125[7] | 5.85[7] | 4.50[7] | 6.35[13] | 6.875[16] | 5.783[25] | 7.585 |
| Portland, Oreg. | 4.70[27] | 4.70[27] | 5.00[27] | 6.75[27] | 4.875[27] | 6.65[27] | 5.000[27] | 6.20[13] | 6.825[16] | 5.983[16] | .... |
| Tacoma, Wash. | 4.60[6] | 4.70[6] | 5.00[6] | 6.75[6] | 4.87[6] | 5.80[6] | 4.60[6] | 6.40[13] | 6.55[16] | 6.23[25] | .... |
| Seattle | 4.60[6] | 4.70[6] | 5.00[6] | 6.75[6] | 4.87[6] | 5.80[6] | 4.60[6] | 6.40[13] | 6.55[16] | 6.23[25] | .... |

*Basing point cities with quotations representing mill prices, plus warehouse spread; †open market price.

**BASE QUANTITIES**

[1]—400 to 1999 pounds; [2]—400 to 14,999 pounds; [3]—any quantity; [4]—300 to 1999 pounds; [5]—400 to 8999 pounds; [6]—300 to 9999 pounds; [7]—400 to 39,999 pounds; [8]—under 2000 pounds; [9]—under 4000 pounds; [10]—500 to 1499 pounds; [13]—one bundle to 39,999 pounds; [13]—150 to 2249 pounds; [15]—150 to 1499 pounds; [14]—three to 24 bundles; [16]—450 to 1499 pounds; [18]—one bundle to 1499 pounds; [17]—one to nine bundles; [18]—one to six bundles; [19]—100 to 749 pounds; [24]—300 to 1999 pounds; [21]—1500 to 39,999 pounds; [26]—1500 to 1999 pounds; [23]—1000 to 39,999 pounds; [24]—400 to 1499 pounds; [25]—1000 to 1999 pounds; [26]—under 25 bundles. Cold-rolled strip, 2000 to 39,999 pounds, base; [27]—300 to 4999 pounds.

## ORES

**Lake Superior Iron Ore**

*Gross ton, 51½% (Natural) Lower Lake Ports*

| | |
|---|---|
| Old range bessemer | $5.45 |
| Mesabi nonbessemer | 5.05 |
| High phosphorus | 5.05 |
| Mesabi bessemer | 5.20 |
| Old range nonbessemer | 5.30 |

**Eastern Local Ore**

*Cents, units, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56-63% contract | 18.00 |

**Foreign Ore**

*Cents per unit, cif Atlantic ports*

| | |
|---|---|
| Manganiferous ore, 45-55% Fe., 6-10% Mn. | Nom. |
| N. African low phos. | Nom. |
| Swedish basic, 60 to 68% | Nom. |
| Spanish, N. African basic, 50 to 60% | Nom. |
| Brazil iron ore, 68-69% fob Rio de Janeiro | 7.50-8.00 |

**Tungsten Ore**

| | |
|---|---|
| Chinese Wolframite, per short ton unit, duty paid | $24.00 |

**Chrome Ore**

*Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.*

*(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)*

Indian and African

| | |
|---|---|
| 48% 2.8:1 | $39.75 |
| 48% 3:1 | 41.00 |
| 48% no ratio | 31.00 |

South African (Transvaal)

| | |
|---|---|
| 44% no ratio | $27.40 |
| 45% no ratio | 28.30 |
| 48% no ratio | 31 00 |
| 50% no ratio | 32.80 |

Brazilian—nominal

| | |
|---|---|
| 44% 2.5:1 lump | $33.65 |
| 48% 3:1 lump | 43.50 |

Rhodesian

| | |
|---|---|
| 45% no ratio | $28.30 |
| 48% no ratio | 31.00 |
| 48% 3:1 lump | 41.00 |

Domestic (seller's nearest rail)

| | |
|---|---|
| 48% 3:1 | $43.50 |

less $7 freight allowance.

**Manganese Ore**

Sales prices of Office of Metals Reserve, cents per gross ton unit, dry, 48%, at New York, Philadelphia, Baltimore, Norfolk, Mobile and New Orleans, 85c; Fontana, Calif., Provo, Utah, and Pueblo, Colo., 91c; prices include duty on imported ore and are subject to established premiums, penalties and other provisions. Price at basing points which are also points of discharge of imported manganese ore is fob cars, shipside, at dock most favorable to the buyer. Outside shipments direct to consumers at 15c to 17c per unit less than Metal Reserve prices.

**Molybdenum**

| | |
|---|---|
| Sulphide conc., lb., Mo. cont., mines | $0.75 |

## NATIONAL EMERGENCY STEELS (Hot Rolled)

(Extras for alloy content)

Basic open-hearth Electric furnaces

| Designation | Chemical Composition Limits, Per Cent: Carbon | Mn | Si | Cr | Ni | Mo | Bars per 100 lb. | Billets per GT | Bars per 100 lb. | Billets per GT |
|---|---|---|---|---|---|---|---|---|---|---|
| NE 9415 | .13-.18 | .80-1.10 | .20-.35 | .30-.50 | .30-.60 | .08-.15 | $0.812 | $16.230 | $1.353 | $27.050 |
| NE 9425 | .23-.28 | .80-1.20 | .20-.35 | .30-.50 | .30-.60 | .08-.15 | .812 | 16.230 | 1.353 | 27.050 |
| NE 9442 | .40-.45 | 1.00-1.30 | .20-.35 | .30-.50 | .30-.60 | .08-.15 | .866 | 17.312 | 1.407 | 28.132 |
| NE 9722 | .20-.25 | .50-.80 | .20-.35 | .10-.25 | .40-.70 | .15-.25 | .703 | 14.066 | 1.244 | 24.886 |
| NE 9912 | .10-.15 | .50-.70 | .20-.35 | .40-.60 | 1.00-1.30 | .20-.30 | 1.298 | 25.968 | 1.677 | 33.542 |
| NE 9920 | .18-.23 | .50-.70 | .20-.35 | .40-.60 | 1.00-1.30 | .20-.30 | 1.298 | 25.968 | 1.677 | 33.542 |

Extras are in addition to a base price of 2.921c, per pound on finished products and $58.43 per gross ton on semifinished steel major basing points and are in cents per pound and dollars per gross ton. No prices quoted on vanadium alloy.

## Pig Iron

Maximum prices per gross ton fixed by OPA schedule No. 10, last amended July 27, 1946; $2 increase may be charged on adjustable pricing contracts made between May 29 and July 27. Delivered prices do not include 3 per cent federal tax, effective Dec. 1, 1942.

| | No. 2 Foundry | Basic | Bessemer | Malleable |
|---|---|---|---|---|
| **Bethlehem, Pa.,** base | $29.50 | $29.00 | $30.50 | $30.00 |
| Newark, N. J., del. | 31.20 | 30.70 | 32.20 | 31.70 |
| Brooklyn, N. Y., del. | 32.28 | ..... | ..... | 32.78 |
| **Birdsboro, Pa.,** base | 29.50 | 29.00 | 30.50 | 30.00 |
| **Birmingham,** base | 24.88 | 23.50 | 29.50 | ..... |
| Baltimore, del. | 30.22 | ..... | ..... | ..... |
| Boston, del | 29.68 | ..... | ..... | ..... |
| Chicago, del. | 28.72 | ..... | ..... | ..... |
| Cincinnati, del. | 28.94 | 28.06 | ..... | ..... |
| Cleveland, del. | 28.62 | 27.74 | ..... | ..... |
| Newark, N. J. | 30.82 | ..... | ..... | ..... |
| Philadelphia, del. | 30.05 | 29.55 | ..... | ..... |
| St. Louis, del. | 28.62 | 29.54 | ..... | ..... |
| **Buffalo,** base | 28.50 | 27.50 | 29.50 | 29.00 |
| Boston, del. | 30.06 | 29.56 | 31.06 | 30.56 |
| Rochester, del. | 30.03 | ..... | 31.03 | 30.53 |
| Syracuse, del. | 30.58 | ..... | 31.58 | 31.08 |
| **Chicago,** base | 28.50 | 28.00 | 29.00 | 28.50 |
| Milwaukee, del. | 29.73 | 29.23 | 30.23 | 29.73 |
| Muskegon, Mich., del. | 32.05 | ..... | ..... | 32.05 |
| **Cleveland,** base | 28.50 | 28.00 | 29.00 | 28.50 |
| Akron, Canton, del. | 30.04 | 29.54 | 30.54 | 30.04 |
| **Detroit,** base | 28.50 | 28.00 | 29.00 | 28.50 |
| Saginaw, Mich., del. | 30.81 | 30.31 | 31.31 | 30.81 |
| **Duluth,** base | 29.00 | 28.50 | 29.50 | 29.00 |
| St. Paul, del. | 31.13 | 30.63 | 31.63 | 31.13 |
| **Erie, Pa.,** base | 28.50 | 28.00 | 29.50 | 29.00 |
| **Everett, Mass.,** base | 29.50 | 29.00 | 30.50 | 30.00 |
| Boston, del. | 30.06 | 29.56 | 31.06 | 30.56 |
| **Granite City, Ill.,** base | 28.50 | 28.00 | 29.00 | 28.50 |
| St. Louis, del. | 29.00 | 28.50 | ..... | 29.00 |
| **Hamilton, O.,** base | 28.50 | 28.00 | ..... | 28.50 |
| Cincinnati, del. | 29.68 | 29.18 | ..... | 29.68 |
| **Neville Island, Pa.,** base | 28.50 | 28.00 | 29.00 | 28.50 |
| •Pittsburgh, del., N.&S. sides | 29.27 | 28.77 | 29.77 | 29.27 |
| **Provo, Utah,** base | 26.50 | 26.00 | ..... | ..... |
| **Sharpsville, Pa.,** base | 28.50 | 28.00 | 29.00 | 28.50 |
| **Sparrows Point,** base | 29.50 | 29.00 | ..... | ..... |
| Baltimore, del. | 30.60 | ..... | ..... | ..... |
| **Steelton, Pa.,** base | ..... | 29.00 | ..... | ..... |
| **Swedeland, Pa.,** base | 29.50 | 29.00 | 30.50 | 30.00 |
| Philadelphia, del. | 30.43 | 29.93 | ..... | 30.93 |
| **Toledo, O.,** base | 28.50 | 28.00 | 29.00 | 28.50 |
| **Youngstown, O.,** base | 28.50 | 28.00 | 29.00 | 28.50 |
| Mansfield, O., del. | 30.66 | 30.16 | 31.16 | 30.66 |

• To Neville Island base add: 61c for McKees Rocks, Pa.; 93c Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.24, Oakmont, Verona; $1.38, Brackenridge.

Exceptions to above prices: Struthers Iron & Steel Co., Struthers, O., may charge 50 cents a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable pig iron. Republic Steel Corp. may quote $2 a ton higher for foundry and basic pig iron on the Birmingham base.

### High Silicon, Silvery

6.00-6.50 per cent (base) ....$34.00

| | | | |
|---|---|---|---|
| 6.51-7.00 | $35.00 | 9.01- 9.50 | 40.00 |
| 7.01-7.50 | 36.00 | 9.51-10.00 | 41.00 |
| 7.51-8.00 | 37.00 | 10.01-10.50 | 42.00 |
| 8.01-8.50 | 38.00 | 10.51-11.00 | 43.00 |
| 8.51-9.00 | 39.00 | 11.01-11.50 | 44.00 |

Fob Jackson county, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

**Electric Furnace Ferrosilicon:** Si 14.01 to 14.50%, $50 Jackson co.; each additional 0.50% silicon up to and including 18% add $1; low impurities not exceeding 0.005 P, 0.40 Si, 1.0% C, add $1.

### Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

### Charcoal Pig Iron

Semi-cold blast, low phosphorus.

Fob furnace, Lyles, Tenn., $33.00. (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

### Gray Forge

Neville Island, Pa. .....$28.00
Valley base ..... 28.00

### Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Buffalo, N. Y., $34.00 base; $35.38, del., Philadelphia. Intermediate phosphorus, Central Furnace, Cleveland, $31.00.

### Differentials

Basing point prices are subject to following differentials:

**Silicon:** An additional charge not to exceed 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

**Phosphorus:** A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

**Manganese:** An additional charge not to exceed 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

**Nickel:** An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

## Refractories

Per 1000, fob shipping point. Net prices

### Fire Clay Brick

Super Duty

Pa., Mo., Ky. .....$81.00

High Heat Duty

Pa., Ill., Md., Mo., Ky. .... 65.00
Ala., Ga. ..... 65.00
N. J. ..... 70.00

Intermediate Heat Duty

Ohio ..... 57.00
Pa., Ill., Md., Mo., Ky. ..... 59.00
Ala., Ga. ..... 51.00
N. J. ..... 62.00

Low Heat Duty

Pa., Md., Ohio ..... 51.00

### Malleable Bung Brick

All bases ..... 75.00

### Ladle Brick

(Pa., O., W. Va., Mo.)

Dry Press ..... 42.00
Wire Cut ..... 40.00

### Silica Brick

Pennsylvania ..... 65.00
Joliet, E. Chicago ..... 74.00
Birmingham, Ala. ..... 65.00

### Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.
Bulk ..... 22.00
Bags ..... 26.00

### Basic Brick

Net ton, fob Baltimore, Plymouth Meeting, Chester, Pa.
Chrome brick ..... 54.00
Chem. bonded chrome ..... 54.00
Magnesite brick ..... 76.00
Chem. bonded magnesite ... 65.00

## Fluorspar

Metallurgical grade, fob shipping point in Ill., Ky., net ton, carloads, effective $CaF_2$ content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

## Ferroalloy Prices

**Spiegeleisen:** 19-21% carlot per gross ton, Palmerton, Pa., $36; Pittsburgh, $40.50; Chicago, $40.60.

**Ferromanganese, standard:** 78-82% c.l. gross ton, duty paid, $135 fob cars, Baltimore, Philadelphia or New York, whichever is most favorable to buyer, Rockdale or Rockwood, Tenn. (where Tennessee Products Co. is producer), Birmingham, Ala. (where Sloss-Sheffield Steel & Iron Co. is producer); $140 fob cars, Pittsburgh (where Carnegie-Illinois Steel Corp. is producer); add $6 for packed c.l., $10 for ton, $13.50 for less ton; $1.70 for each 1%, or fraction contained manganese over 82% or under 78%.

**Ferromanganese, low carbon:** Eastern zone: Special, 21c; regular, 20.50c; medium, 14.50c; central zone: Special, 21.30c; regular, 20.80c; medium, 14.80c; western zone: Special, 21.55c; regular, 21.05c; medium, 15.75c. Prices are per pound contained Mn, bulk carlot shipments, fob shipping point, freight allowed. Special low-carbon has content of 90% Mn, 0.10% C, and 0.06% P.

**Ferromanganese Briquets:** (Weight approx. 3 lb and containing exactly 2 lb Mn) per lb of briquets. Contract, carlots, bulk 0.0605c, packed 0.063c, tons 0.0655c, less 0.068c, eastern, freight allowed; 0.063c, 0.0655c, 0.0755c and 0.078c, central; 0.066c, 0.0685c, 0.0855c and 0.088c, western; spot up 0.25c.

**Ferrotungsten:** Spot 10,000 lb or more, per lb contained W, $1.90; contract, $1.88; freight allowed as far west as St. Louis.

**Ferrotitanium:** 40-45%, R.R. freight allowed, per lb contained Ti; ton lots $1.23; less-ton lots $1.25; eastern. Spot up 5c per lb.

**Ferrotitanium:** 20-25%, 0.10 maximum carbon; per lb contained Ti; ton lots $1.35; less-ton lots $1.40 eastern. Spot up 5c per lb.

**Ferrotitanium, High-Carbon:** 15-20% contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C $142.50; 3-5% C $157.50.

**Ferrovanadium:** V 35-55%, contract basis, per lb contained V, fob producers plant with usual freight allowances; open-hearth grade $2.70; special grade $2.80; highly-special grade $2.90.

**Ferromolybdenum:** 55-75% per lb. contained Mo, fob. Langeloth and Washington, Pa., furnace, any quantity 95.00c.

**Ferrophosphorus:** 17-19%, based on 18% P content with unitage of $3 for each 1% of P above or below the base; gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

**Ferrosilicon:** Contract, lump, packed; eastern zone quotations: 90-95% c.l. 12.65c, ton lots 13.10c, smaller lots 13.50c; 80-90% c.l. 10.35c, ton lots 10.85c, smaller lots 11.35c; 75% c.l. 9.40c, ton lots 9.95c, smaller lots 10.45c; 50% c.l. 7.90c, ton lots 8.50c, smaller lots 9.10c. Prices are fob shipping point, freight allowed, per lb. of contained Si. Spot prices 0.25c higher on 80-90%, 0.30c on 75%, 0.45c on 50%. Deduct 0.85c for bulk carlots.

**Ferro-Boron:** (B 17.50% min., Si 1.50% max., Al 0.50% max. and C 0.50% max.) per lb of alloy contract ton lots $1.20, less ton lots $1.30, eastern, freight allowed; $1.2075 and $1.3075 central; $1.229 and $1.329, western; spot add 5c.

**Ferrocolumbium:** 50-60% per lb contained columbium in gross ton lots, contract basis, R. R. freight allowed, eastern zone, $2.25; less-ton lots $2.30. Spot prices up 10 cents.

**Ferrochrome:** Contract, lump, packed; **high carbon, eastern zone,** c.l. 15.05c, ton lots 15.55c; central zone, add 0.40c and 0.65c; western zone, add 0.5c and 1.85c; **high carbon, high nitrogen,** add 5c to all high carbon ferrochrome prices. Deduct 0.55c for bulk carlots. Spot prices up 0.25c.

**Low carbon,** eastern zone, bulk, c.l., max. 0.06% C 23c; 0.1% 22.50c, 0.15% 22c, 0.2% 21.50c, 0.5% 21c, 1% 20.50c, 2% 19.50c, add 1c for 2000 lb to c.l.; central zone, add 0.4c for bulk, c.l., and 0.65c for 2000 lb to c.l.; western zone, add 0.5c for bulk, c.l., and 1.85c for 2000 lb to c.l.; carload packed differential 0.45c. Prices are per pound of contained Cr, fob shipping points. **Low carbon, high nitrogen:** Add 2c to low carbon ferrochrome prices. For higher nitrogen low carbon, add 2c for each 0.25% of nitrogen over 0.75%.

**Ferrochrome, Special Foundry:** (Cr 62-66%, C about 5-7%): Contract, lump, packed, eastern zone, freight allowed, c.l. 15.60c, ton lots 16.10c, less than ton 16.75c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.85c for smaller lots. Deduct 0.55c for bulk carlots.

**S. M. Ferrochrome, high carbon** (Cr 60-65%, Si, Mn and C 4-6% each): Contract, lump, packed, eastern zone, freight allowed, c.l. 16.15c, ton lots 16.65c, less ton 17.30c; central zone, add 0.40c for c.l. and 0.65c for smaller lots; western zone, add 0.5c for c.l. and 1.85c for smaller lots. Prices are per lb of contained chromium; spot prices 0.25c higher. Deduct 0.55c for bulk carlots.

**S.M. Ferrochrome, low carbon:** (Cr 62-66%, Si 4-6%, Mn 4-6% and C 1.25% max.) Contract, carlot, bulk, 20.00c, packed 20.45c, ton lots 21.00c, less ton lots 22.00c, eastern, freight allowed, per pound contained chromium, 20.40c, 20.50c, 20.95c and 22.65c, central; 21.00c, 21.45c, 22.85c and 23.85c, western; spot up 0.25c.

**Ferrochrome Briquets:** Containing exactly 2 lb. Cr, packed eastern zone, c.l. 9.50c, ton lots 9.80c, less than ton 10.10c, central zone, add 0.3c for c.l. and 0.5c for smaller lots; western zone, add 0.70c for c.l. and 2c for smaller lots. Deduct 0.30c for bulk carlots. Prices per lb. of briquets; spot prices 0.25c higher.

**Chromium Metal:** 97% min. chromium, max. 0.50% carbon, eastern zone, per lb contained chromium bulk, c.l., 79.50c, 2000 lb to c.l. 80c; central 81c and 82.50c; western 82.25c and 84.75c; fob shipping point, freight allowed.

**Chromium-Copper:** (Cr 8-11%, Cu 88-90%, Fe 1% max., Si 0.50% max.) contract, any quantity, 45c, eastern, Niagara Falls, N. Y., basis, freight allowed to destination, except to points taking rate in excess of St. Louis rate to which equivalent of St. Louis rate will be allowed; spot up 2c.

**Calcium metal; cast:** Contract ton lots or more $1.35, less, $1.60, pound of metal; $1.36 and $1.61 central, $1.40 and $1.65, western; spot up 5c.

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18% and Si 53-59%), per lb. of alloy. Contract, carlots, 15.50c, ton lots 16.50c and less 17.00c, eastern, freight allowed; 16.00c, 17.35c, and 17.85c, central; 18.05c, 19.10c and 19.60c western; spot up 0.25c.

**Calcium - Silicon:** (Ca 30-35%, Si 60-65% and Fe 3.00% max.), per lb. of alloy. Contract, carlots, lump 13.00c, ton lots 14.50c, less 15.50c eastern, freight allowed; 13.50c, 15.25c and 16.25c, central; 15.55c, 17.40c and 18.40c, western; spot up 0.25c.

**Silicon Metal:** Min. 97% Si and max. 1% Fe, eastern zone, bulk, c.l., 12.90c; 2000 lb to c.l., 13.45c; central, 13.20c and 13.90c; western, 13.85c and 16.80c; min. 96% Si and max. 2% Fe, eastern, bulk; c.l., 12.50c, 2000 lb to c.l., 13.10c; central, 12.80c and 13.55c; western, 13.45c and 16.50c, fob shipping point, freight allowed. Price per lb contained Si.

**Silicomanganese,** containing exactly 2 lb. Mn and about ½ lb. Si, eastern zone, bulk, c.l. 5.80c, ton lots 6.35c; central zone, add 0.25c for c.l. and 1c for ton lots; western, add 0.55c for c.l. and 0.20c for ton lots. **Ferrosilicon,** weighing about 5 lb. and containing exactly 2 lb. Si, or about 2½ lb. and containing exactly 1 lb. Si, packed, eastern zone, c.l. 3.90c, ton lots 4.15c, less ton lots 4.45c; central zone, add 0.15c for c.l. and 0.40c for smaller lots; western zone, add 0.30c for c.l. and 0.45c for smaller lots. Prices are fob shipping point, freight allowed; spot prices 0.25c higher. Deduct 0.30c for bulk carlots.

**Manganese Metal:** (Min. 96% Mn, max. 2% Fe), per lb of metal, eastern zone, bulk, c.l., 30c, 2000 lb to c.l., 32c, central, 30.25c, and 33c; western, 30.55c and 35.05c.

**Electrolytic Manganese:** 99.9% plus, fob Knoxville, Tenn., freight allowed east of Mississippi on 250 lb or more: Carlots 32c, ton lots 34c, drum lots 36c, less than drum lot 38c. Add 1½c for hydrogen-removed metal.

**Manganese-Boron:** (Mn 75% approx., B 15-20%, Fe 5% max., Si 1.50% max. and C 3% max.) per lb of alloy. Contract ton lots, $1.89, less $2.01, eastern; freight allowed; $1.903 and $2.023, central, $1.935 and $2.055 western; spot up 5c.

**Nickel-Boron:** (B 15-18%, Al 1% max., Si 1.50% max., C 0.50% max., Fe 3% max., Ni, balance), per lb of alloy. Contract, 5 tons or more, $1.90, 1 ton to 8 ton, $2.00, less than ton $2.10, eastern, freight allowed; $1.9125, $2.0125 and $2.1125, central; $1.9445, $2.0445 and $2.1445, western; spot same as contract.

**Borosil:** 3 to 4% B, 40 to 45% Si, $6.25 lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

**Bortam:** B 1.5-1.9%, ton lots, 45c lb; less-ton lots, 50c lb.

**Carbortam:** B 0.90 to 1.15% net ton to carload, 8c per lb fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

**Silicaz Alloy:** (Si 35-40%, Ca 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy contract, carlots 25.00c, ton lots 26.00c, less ton lots 27.00c, eastern, freight allowed, 25.50c, 26.75c and 27.75c, central; 27.50c, 28.90c and 29.90c, western; spot up 0.25c.

**Silvaz Alloy:** (Si 35-40%, Va 9-11%, Al 5-7%, Zr 5-7%, Ti 9-11% and B 0.55-0.75%), per lb of alloy. Contract, carlots 58.00c, ton lots 59.00c, less 60.00c, eastern freight allowed; 58.50c, 59.75c and 60.75c, central; 60.50c, 61.90c and 62.90c, western; spot up 0.25c.

**SMZ Alloy:** (Si 60-55%, Mn 5-7%, Zr 5-7% and Fe approx. 20% (per lb of alloy contract carlots 11.50c, ton lots 12.00c, less 12.50c, eastern zone, freight allowed; 12.00c, 12.85c and 13.35c central zone; 14.05c, 14.60c and 15.10c, western; spot up 0.25c.

**CMSZ Alloy 4:** (Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75% and C 3.00-4.50%). Contract carlots, bulk 11.00c and packed 11.50c; ton lots 12.00c; less 12.50c, eastern, freight allowed; 11.50c and 12.00c, 12.75c, 13.25c, central; 13.50c and 14.00c, 14.75c, 15.25c, western; spot up 0.25c.

**CMSZ Alloy 5:** (Cr 50-56%, Mn 4-6%, Si 13.50-16.00%, Zr 0.75-1.25%, C 3.50-5.00%) per lb of alloy. Contract, carlots, bulk, 10.75c, packed 11.25c, ton lots 11.75c, less 12.25c, eastern, freight allowed; 11.25c, 11.75c, 12.50c and 13.00c, central; 13.25c and 13.75c, 14.50c and 15.00c, western; spot up 0.25c.

**Zirconium Alloy:** Zr 12-15%, per lb of alloy, eastern contract, carlots, bulk, 4.60c, packed 4.80c, ton lots 4.80c, less tons 5c, carloads, bulk, per gross ton $102.50; packed $107.50; ton lots $108; less-ton lots $112.50. Spot up $5 per ton.

**Zirconium Alloy:** Zr 35-40%, eastern, contract basis, carloads in bulk or package, per lb of alloy 14.00c; gross ton lots 15.00c; less-ton lots 16.00c. Spot up ¼c.

**Alsifer:** (Approx. 20% Al, 40% Si, 40% Fe) contract basis fob Niagara Falls, N. Y., lump per lb 5.88c; ton lots 6.38c; less 6.88c. Spot up ½c.

**Siminal:** (Approx. 20% each Si, Mn, Al) Contract, freight not exceeding St. Louis rate allowed, per lb alloy; carlots 8c; ton lots 8.75c; less-ton lots 9.25c.

**Tungsten Metal Powder:** Spot, not less than 97%, $2.50-$2.60; freight allowed as far west as St. Louis.

**Grainal:** Vanadium Grainal No. 1 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

**Vanadium Pentoxide,** technical grade: Fused, approx. 89-92% $V_2O_5$ and 5.84% $NA_2O$; or air dried, 83-85% $V_2O_5$ and 5.15% $NA_2O$, $1.10 per lb contained $V_2O_5$, fob plant, freight allowed on quantities of 25 lb and over to St. Louis.

# OPEN MARKET PRICES, IRON AND STEEL SCRAP

Following prices are quotations developed by editors of STEEL in the various centers. Quotations are on gross tons.

**PHILADELPHIA:**
(Delivered consumer's plant)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $18.75 |
| No. 2 Heavy Melt. Steel | 18.75 |
| No. 2 Bundles | 18.75 |
| No. 3 Bundles | 16.75 |
| Mixed Borings, Turnings | 13.75 |
| Machine Shop Turnings | 13.75 |
| Billet, Forge Crops | 23.75 |
| Bar Crops, Plate Scrap | 21.25 |
| Cast Steel | 21.25 |
| Punchings | 21.25 |
| Elec. Furnace Bundles | 19.75 |
| Heavy Turnings | 18.25 |

**Cast Grades**
(Fob Shipping Point)

| | |
|---|---|
| Heavy Breakable Cast | 16.50 |
| Charging Box Cast | 19.00 |
| Cupola Cast | 20.00 |
| Unstripped Motor Blocks | 17.50 |
| Malleable | 22.00 |
| Chemical Borings | 16.51 |

**NEW YORK:**
(Dealers' buying prices)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $15.33 |
| No. 2 Heavy Melt. Steel | 15.33 |
| No. 2 Hyd. Bundles | 15.33 |
| No. 3 Hyd. Bundles | 13.33 |
| Chemical Borings | 14.33 |
| Machine Turnings | 10.33 |
| Mixed Borings, Turnings | 10.33 |
| No. 1 Cupola | 20.00 |
| Charging Box | 19.00 |
| Heavy Breakable | 16.50 |
| Unstripped Motor Blocks | 17.50 |
| Stove Plate | 19.00 |

**BOSTON:**
(Fob shipping points. Boston differential 99c higher, steelmaking grades; Providence, $1.09 higher)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $14.06 |
| No. 2 Heavy Melt. Steel | 14.06 |
| No. 1 Bundles | 14.06 |
| No. 2 Bundles | 14.06 |
| No. 1 Busheling | 14.06 |
| Machine Shop Turnings | 9.06 |
| Mixed Borings, Turnings | 9.06 |
| Short Shovel Turnings | 11.06 |
| Chemical Borings | 13.31 |
| Low Phos. Clippings | 16.56 |
| No. 1 Cast | 20.00 |
| Clean Auto Cast | 20.00 |
| Stove Plate | 19.00 |
| Heavy Breakable Cast | 16.50 |

**BUFFALO:**
(Delivered consumers' plant)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $19.25 |
| No. 2 Heavy Melt. Steel | 19.25 |
| No. 1 Bundles | 19.25 |
| No. 2 Bundles | 19.25 |
| No. 1 Busheling | 19.25 |
| Machine Turnings | 14.25 |
| Short Shovel Turnings | 16.25 |
| Mixed Borings, Turn. | 14.25 |
| Cast Iron Borings | 15.25 |
| No. 1 Cast | 20.00 |
| Low Phos. | 21.75 |

**PITTSBURGH:**
(Delivered consumers' plant)

| | |
|---|---|
| Railroad Heavy Melting | $21.00 |
| No. 1 Heavy Melt. Steel | 20.00 |
| No. 2 Heavy Melt. Steel | 20.00 |
| No. 1 Comp. Bundles | 20.00 |
| No. 2 Comp. Bundles | 20.00 |
| Short Shovel Turnings | 17.00 |
| Mach. Shop Turnings | 15.00 |
| Mixed Borings, Turnings | 15.00 |
| No. 1 Cupola Cast | •20.00 |
| Heavy Breakable Cast | •16.50 |
| Cast Iron Borings | 16.00 |
| Billet, Bloom Crops | 25.00 |
| Sheet Bar Crops | 22.50 |
| Plate Scrap, Punchings | 22.50 |
| Railroad Specialties | 24.50 |
| Scrap Rail | 21.50 |
| Axles | 26.00 |
| Rail 3 ft. and under | 23.50 |
| Railroad Malleable | 22.00 |

• Shipping point.

**CLEVELAND:**
(Delivered consumer's plant)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $19.50 |
| No. 2 Heavy Melt. Steel | 19.50 |
| No. 1 Comp. Bundles | 19.50 |
| No. 2 Comp Bundles | 19.50 |
| No. 1 Busheling | 19.50 |
| Mach. Shop Turnings | 14.50 |
| Short Shovel Turnings | 16.50 |
| Mixed Borings, Turnings | 14.50 |
| No. 1 Cupola Cast | 20.00 |
| Heavy Breakable Cast | 16.50 |
| Cast Iron Borings | 13.50-14.00 |
| Billet, Bloom Crops | 24.50 |
| Sheet Bar Crops | 22.00 |
| Plate Scrap, Punchings | 22.00 |
| Elec. Furnace Bundles | 20.50 |

**VALLEY:**
(Delivered consumer's plant)

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | $21.00 |
| No. 1 Heavy Melt. Steel | 20.00 |
| No. 1 Comp. Bundles | 20.00 |
| Short Shovel Turnings | 17.00 |
| Cast Iron Borings | 16.00 |
| Machine Shop Turnings | 15.00 |
| Low Phos. Plate | 22.50 |

**MANSFIELD:**
(Delivered consumer's plant)

| | |
|---|---|
| Machine Shop Turnings | $15.00 |

**CINCINNATI:**
(Delivered consumer's plant)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $19.50 |
| No. 2 Heavy Melt. Steel | 19.50 |
| No. 1 Comp. Bundles | 19.50 |
| No. 2 Comp. Bundles | 19.50 |
| Machine Turnings | 10.50-11.00 |
| Shoveling Turnings | 12.50-13.00 |
| Cast Iron Borings | 11.50-12.00 |
| Mixed Borings, Turnings | 10.50-11.00 |
| No. 1 Cupola Cast | 20.00 |
| Breakable Cast | 16.50 |
| Low Phosphorus | 21.00-22.00 |
| Scrap Rails | 20.50-21.00 |
| Stove Plate | 18.50-19.00 |

**DETROIT:**
(Delivered consumer's plant)

| | |
|---|---|
| Heavy Melting Steel | $17.32 |
| No. 1 Busheling | 17.32 |
| Hydraulic Bundles | 17.32 |
| Flashings | 17.32 |
| Machine Turnings | 12.32 |
| Short Shovel, Turnings | 14.32 |
| Cast Iron Borings | 13.32 |
| Low Phos. Plate | 19.82 |
| No. 1 Cast | 20.00 |
| Heavy Breakable Cast | 16.50 |

**CHICAGO:**
(Delivered consumer's plant; cast grades fob shipping point; railroad grades fob tracks)

| | |
|---|---|
| No. 1 R.R. Heavy Melt. | $19.75 |
| No. 1 Heavy Melt. Steel | 18.75 |
| No. 2 Heavy Melt. Steel | 18.75 |
| No. 1 Ind. Bundles | 18.75 |
| No. 2 Dlr. Bundles | 18.75 |
| Baled Mach. Shop Turn. | 18.75 |
| No. 3 Galv. Bundles | 16.75 |
| Machine Turnings | 13.75 |
| Mix. Borings, Sht. Turn. | 13.75 |
| Short Shovel Turnings | 15.75 |
| Cast Iron Borings | 14.75 |
| Scrap Rails | 20.25 |
| Cut Rails, 3 feet | 22.25 |
| Cut Rails, 18-inch | 23.50 |
| Rerolling Rails | 22.25 |
| Angles, Splice Bars | 22.25 |
| Plate Scrap, Punchings | 21.25 |
| Railroad Specialties | 22.75 |
| No. 1 Cast | 20.00 |
| R.R. Malleable | 22.00 |

**ST. LOUIS:**
(Delivered consumer's plant; cast grades fob shipping point)

| | |
|---|---|
| Heavy Melting | $17.50 |
| No. 1 Locomotive Tires | 21.00 |
| Misc. Rails | 19.00 |
| Railroad Springs | 22.00 |
| Bundled Sheets | 17.50 |
| Axle Turnings | 17.00 |
| Machine Turnings | 10.50 |
| Shoveling Turnings | 12.50 |
| Rerolling Rails | 21.00 |
| Street Car Axles | 24.50 |
| Steel Rails, 3 ft. | 21.50 |
| Steel Angle Bars | 21.00 |
| Cast Iron Wheels | 20.00 |
| No. 1 Cupola Cast | 20.00 |
| Charging Box Cast | 19.00 |
| Railroad Malleable | 22.00 |
| Breakable Cast | 16.50 |
| Stove Plate | 19.00 |
| Grate Bars | 15.25 |
| Brake Shoes | 15.25 |

**BIRMINGHAM:**
(Delivered consumer's plant)

| | |
|---|---|
| Billet Forge Crops | $22.50 |
| Structural, Plate Scrap | 19.00 |
| Scrap Rails Random | 18.50 |
| Rerolling Rails | 20.50 |
| Angle Splice Bars | 20.50 |
| Solid Steel Axles | 24.00 |
| Cupola Cast | 20.00 |
| Stove Plate | 19.00 |
| Long Turnings | 11.00 |
| Cast Iron Borings | 13.00 |
| Iron Car Wheels | 20.00 |

**LOS ANGELES:**
(Delivered consumer's plant)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $14.00 |
| No. 2 Heavy Melt. Steel | 13.00 |
| No. 1, 2 Dlr. Bundles | 12.00 |
| Machine Turnings | 5.50 |
| Mixed Borings, Turnings | 5.50 |
| No. 1 Cast | 20.00 |

**SAN FRANCISCO:**
(Delivered consumer's plant)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $17.00 |
| No. 2 Heavy Melt. Steel | 17.00 |
| No. 1 Busheling | 17.00 |
| No. 1, No. 2 Bundles | 17.00 |
| No. 3 Bundles | 9.00 |
| Machine Turnings | 7.00 |
| Billet, Forge Crops | 15.50 |
| Bar Crops, Plate | 15.50 |
| Cast Steel | 15.50 |
| Cut, Structural, Plate 1 ft and under | 18.00 |
| Alloy-free Turnings | 7.00 |
| Tin Can Bundles | 14.50 |
| No. 2 Steel Wheels | 21.50 |
| Iron, Steel Axles | 24.00 |
| No. 2 Cast Steel | 20.50 |
| Uncut Frogs, Switches | 18.00 |
| Scrap Rails | 18.50 |
| Locomotive Tires | 20.50 |

**SEATTLE:**
(Delivered consumer's plant)

| | |
|---|---|
| No. 1 Heavy Melt. Steel | $14.50 |
| No. 2 Heavy Melt. Steel | 14.50 |
| Heavy Railroad Scrap | 15.50 |

(Fob shipping point)

| | |
|---|---|
| No. 1 Cupola Cast | 20.00 |

# LOGEMANN
# Presses for Sheet Scrap

## THE NATION NEEDS YOUR SHEET SCRAP!

In mills, industrial plants and scrap yards, LOGEMANN SCRAP PRESSES are working day and night to prepare sheet scrap for the furnaces.

Sheet mills particularly recognize the value of the years of experience and the performance records which back up LOGEMANN designs and workmanship.

The line includes scrap presses *designed for mill Service,* presses *designed for automobile plant conditions,* presses *designed for general plant applications.* Write for details.

The scrap press illustrated operates in one of the largest industrial plants. Compresses scrap from three directions to produce high-density mill size bundles. Built in various capacities.

**LOGEMANN BROTHERS COMPANY**
**3126 W. Burleigh St.** **Milwaukee, Wisconsin**

# NONFERROUS METAL PRICES

**Copper:** Electrolytic or Lake from producers in carlots 14.37½c, del. Conn.; less carlots 14.50c, refinery. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, 14.12½c, refinery, 20,000 lb or more; 14.37½c, less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 15.50c; 88-10-2 (No. 215) 18.75c; 80-10-10 (No. 305) 18.25c; No. 1 yellow (No. 405) 12.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than 20 tons.

**Zinc:** Prime western 8.25c, select 8.35c, brass special 8.50c, intermediate 8.75c, E. St. Louis; high grade 9.25c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

**Lead:** Common 8.10c, chemical 8.20c, corroding, 8.20c, E. St. Louis for carlots; add 5 points for Chicago, Minneapolis-St. Paul, Milwaukee-Kenosha districts; add 15 points for Cleveland - Akron - Detroit area, New Jersey, New York state, Texas, Pacific Coast, Richmond, Indianapolis-Kokomo; add 20 points for Birmingham, Connecticut, Boston - Worcester, Springfield, New Hampshire, Rhode Island.

**Primary Aluminum:** 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

**Secondary Aluminum:** Piston alloy (No. 122 type) 12.75c; No. 12 foundry alloy (No. 2 grade) 12.87½c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.37½c; grade 2 (92-95%) 13.25c; grade 3 (90-92%) 12.00c; grade 4 (85-90%) 11.37½c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

**Magnesium:** Commercially pure (99.8%) standard ingots (4-notch, 17 lb) 20.50c per lb, carlots; 22.50c 100 lb to c.l. Extruded 12-in. sticks 27.50c, carlots; 29.50c 100 lb to c.l.

**Tin:** Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 52.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 51.87½c; Grade C, 99.65-99.79% incl. 51.62½c; Grade D, 99.50-99.64% incl., 51.50c; Grade E, 99-99.49% incl 51.12½c; Grade F, below 99% (for tin content), 51.00c.

**Antimony:** American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 14.50c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 15.00c. On producers' sales add ½c for less than carload to 10,000 lb; ½c for 9999-224 lb; and 2c for 223 lb and less; on sales by dealers, distributors and jobbers add ½c, 1c, and 3c, respectively.

**Nickel:** Electrolytic cathodes, 99.5%, fob refinery 35.00c lb; pig and shot produced from electrolytic cathodes 36.00c; "F" nickel shot or ingot for additions to cast iron, 34.00c.

**Mercury:** Open market, spot, New York, $98-$100 per 76-lb flask.

**Arsenic:** Prime, white, 99%, carlots, 4.00c lb.

**Beryllium-Copper:** 3.75-4.25% Be, $14.75 per lb contained Be.

**Cadmium:** Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.25 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.30.

**Cobalt:** 97-99%, $1.50 lb, for 550 lb (bbl.); $1.52 lb for 100 lb (case); $1.57 lb under 100 lb.

**Gold:** U. S. Treasury, $35 per ounce.

**Indium:** 99.9%, $2.25 per troy ounce.

**Silver:** Open market, N. Y. 90.12½c per ounce.

**Platinum:** $81.50 per ounce.

**Palladium:** $24 per troy ounce.

**Iridium:** $125 per troy ounce.

## Rolled, Drawn, Extruded Products

(Copper and brass product prices based on 14.37½c, Conn., for copper. Freight prepaid on 100 lb or more.)

**Sheet:** Copper 25.81c; yellow brass 23.67c; commercial bronze, 95% 26.14c, 90% 25.81c; red brass, 85% 24.98c, 80% 24.66c; best quality 24.38c; phosphor bronze, grade A 4% or 5%, 43.45c; Everdur, Duronze or equiv., hot rolled, 30.88c; naval brass 28.53c; manganese bronze 31.99c; muntz metal 26.78c; nickel silver 5% 32.38c.

**Rods:** Copper, hot rolled 22.16c, cold drawn 23.16c; yellow brass 18.53c; commercial bronze, 95% 25.83c, 90% 25.50c; red brass, 85% 24.67c; 80% 24.35c; best quality 24.07c; phosphor bronze, grade A 4% or 5% 43.70c; Everdur, Duronze or equiv. cold drawn, 29.82c; naval brass 22.59c; manganese bronze 25.93c; muntz metal 22.34c; nickel silver 5% 34.44c.

**Seamless Tubing:** Copper 25.85c; yellow brass 26.43c; commercial bronze 90% 28.22c; red brass 85% 27.64c, 80% 27.32c; best quality brass 26.79c; phosphor bronze, grade A 5% 44.70c.

**Copper Wire:** Bare, soft, fob eastern mills, carlots 19.89c, less carlots 20.39c; weatherproof, fob eastern mills carlot 22.07c, less carlots 22.57c; magnet, delivered, carlots, 23.30c, 15,000 lb or more 23.55c, less carlots 24.05c.

**Aluminum Sheets and Circles:** 2s and 3s flat mill finish, base 30,000 lb or more del.; sheet widths as indicated; circle diameter 9" and larger:

| Gage | Width | Sheets | Circles |
|---|---|---|---|
| .249"-7 | 12"-48" | 22.70c | 25.20c |
| 8-10 | 12"-48" | 23.20c | 25.70c |
| 11-12 | 26"-48" | 24.20c | 27.00c |
| 13-14 | 26"-48" | 25.20c | 28.50c |
| 15-16 | 26"-48" | 26.40c | 30.40c |
| 17-18 | 26"-48" | 27.90c | 32.90c |
| 19-20 | 24"-42" | 29.80c | 35.30c |
| 21-22 | 24"-42" | 31.70c | 37.20c |
| 23-24 | 3"-24" | 25.60c | 29.20c |

**Lead Products:** Prices to jobbers; full sheets 11.25c; cut sheets 11.50c; pipe 9.90c, New York, 10.00c Philadelphia, Baltimore, Rochester and Buffalo, 10.50c Chicago, Cleveland, Worcester and Boston.

**Zinc Products:** Sheet fob mill, 13.15c, 36,000 lb and over deduct 7%. Ribbon and strip 12.25c, 3000-lb lots deduct 1%, 6000 lb 2%, 9000 lb 3%, 18,000 lb 4%, carloads and over 7%. Boiler plate (not over 12") 3 tons and over 11.00c; 1-3 tons 12.00c; 500-2000 lb 12.50c; 100-500 lb 13.00c; under 100 lb 14.00c. Hull plate (over 12") add 1c to boiler plate prices.

## PLATING MATERIALS

**Chromic Acid:** 99.75%, flake, del., carloads 16.25c; 5 tons and over 16.75c; 1-5 tons 17.25c; 400 lb to 1 ton 17.75c; under 400 lb 18.25c.

**Copper Anodes:** In 500-lb lots, fob shipping point, freight allowed, cast oval over 15 in., 25.125c; curved, 20.375c; round oval straight, 19.375c; electro-deposited, 18.875c.

**Copper Carbonate:** 52-54% metallic Cu, 250 lb barrels 20.50c.

**Copper Cyanide:** 70-71% Cu, 100-lb kegs or bbls 34.00c, fob, Niagara Falls.

**Sodium Cyanide:** 96%, 200-lb drums 15.00c; 10,000-lb lots 13.00c fob Niagara Falls.

**Nickel Anodes:** 500-2999 lb lots; cast and rolled carbonized 47.00c; rolled depolarized 48.00c.

**Nickel Chloride:** 100-lb kegs or 275-lb bbls 18.00c lb, del.

**Tin Anodes:** 1000 lb and over 58.50c del.; 500-999 59.00c; 200-499 59.50c; 100-199 61.00c.

**Tin Crystals:** 400 lb bbls 39.00c fob Grasselli, N. J.; 100-lb kegs 39.50c.

**Sodium Stannate:** 100 or 300-lb drums 36.50c, del.; ton lots 35.50c.

**Zinc Cyanide:** 100-lb kegs or bbls 33.00c fob Niagara Falls.

## Scrap Metals

**Brass Mill Allowances:** Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

| | Clean Heavy | Rod Ends | Clean Turnings |
|---|---|---|---|
| Copper | 12.000 | 12.000 | 11.250 |
| Yellow brass | 9.875 | 9.625 | 9.125 |
| Commercial bronze | | | |
| 95% | 11.250 | 11.000 | 10.500 |
| 90% | 11.125 | 10.875 | 10.375 |
| Red brass | | | |
| 85% | 10.875 | 10.625 | 10.125 |
| 80% | 10.875 | 10.625 | 10.125 |
| Best quality (71-79%) | 10.500 | 10.250 | 9.750 |
| Muntz metal | 9.250 | 9.000 | 8.500 |
| Nickel silver, 5% | 10.500 | 10.250 | ..... |
| Phos. br., A, B, 5% | 12.750 | 12.500 | 11.500 |
| Naval brass | 9.500 | 9.250 | 8.750 |
| Manganese bronze | 9.500 | 9.250 | 8.750 |

**Other than Brass Mill Scrap:** Prices apply on material not meeting brass mill specifications and are fob shipping point; add ¾c for shipment of 60,000 lb of one group and ½c for 20,000 lb of second group shipped in same car. Typical prices follow:

(Group 1) No. 1 heavy copper and wire, No. 1 tinned copper and copper borings 11.50c; No. 2 copper wire and mixed heavy copper, copper tuyeres 10.50c.

(Group 2) Soft red brass and borings, aluminum bronze 10.75c; copper-nickel solids and borings 11.00c; lined car boxes, cocks and faucets 9.50c; bell metal 17.25c; babbitt-line brass bushings 14.75c.

(Group 3) Admiralty condenser tubes, brass pipe 8.75c; muntz metal condenser tubes 8.25c; old rolled brass 8.25c; manganese bronze solids; (lead 0%-0.40%) 8.00c; (lead 0.41%-1%) 7.00c; manganese bronze borings, 7.25c.

**Aluminum Scrap:** Price fob point of shipment, truckloads of 5000 pounds or over: Segregated solids, 2S, 3S, 5c lb, 11, 14, etc., 3 to 3.50c lb. All other high grade alloys 5c lb. Segregated borings and turnings, wrought alloys, 2, 2.50c lb. Other high-grade alloys 3.50c, 4.00c lb. Mixed plant scrap, all solids, 2, 2.50c lb borings and turnings one cent less than segregated.

**Lead Scrap:** Prices fob point of shipment. For soft and hard lead, including cable lead, deduct 0.75c from basing point prices for refined metal.

**Zinc Scrap:** New clippings 7.25c, old zinc 5.75c, fob point of shipment, add ½c for 10,000 lb or more. New die cast scrap 4.95c, radiator grilles 4.95c, add ½c for 20,000 lb or more. Unsweated zinc dross, die cast slab 5.80c, any quantity.

**Nickel, Monel Scrap:** Prices fob point of shipment; add ½c for 2000 lb or more of nickel or cupro-nickel shipped at one time and 20,000 lb or more of monel. Converters (dealers) allowed 2c premium.

**Nickel:** 98% or more nickel and not over ½% copper 23.00c; 90-98% nickel, 23.00c per lb nickel contained.

**Cupro-nickel:** 90% or more combined nickel and copper 26.00c per lb contained nickel, plus 8.00c per lb contained copper; less than 90% combined nickel and copper 26.00c for contained nickel only.

**Monel:** No. 1 castings, turnings 15.00c; new clipping 20.000c; solder sheet 18.00c.

## Sheets, Strip . . .

*Some sellers plan to open first quarter books soon; output at peak for year with backlogs heavy*

Sheet & Strip Prices, Page 156

**New York** — Some leading sheet sellers believe they may be in position in open books for first quarter by around Sept. 15. By that time they believe they will know about where they stand on rated tonnage for fourth quarter and also on certain special directive tonnage now actively contemplated, notably 40,000 tons of 16-gage cold-rolled sheets for manufacture of caskets for service men who died abroad. This casket tonnage may be allocated at any time, possibly under an AAA directive. Precisely what deliveries will be requested has not yet been made clear.

While sheet sellers in this district have been advised by their customers of various applications the latter have made for CC ratings in fourth quarter, relatively few rated specifications have been received by sellers to date. There have been some, however, including one inquiry for several hundred tons of galvanized, which was received by a seller from a consumer who was not a regular customer, in fact, the buyer claims he had never sold the consumer a pound of steel. The matter is understood to have been put up to Washington for final decision.

The attitude of sellers generally, and in this they appear to find support in the wording of the CPA regulation governing the matter, is they will accept rated tonnage only from regular customers. They may be called upon by ratings to supply more in fourth quarter than they have scheduled for a number of their customers and if they are they will likely arrange to handle this additional tonnage and cutback on nonrated schedules accordingly, but their position generally is that they will not accept rated tonnage from other than regular trade, unless under special pressure from Washington.

By having pared down quotas of new tonnage for the current quarter as compared with the preceding period, some producers, selling on a quarterly quota basis, believe that by the end of this quarter their arrearages will not be heavy. However, it is still too early for them to make an accurate estimate, and this also is a factor in their present delay in opening books for next year.

**Pittsburgh**—Mills do not know where they stand on steel to meet rated orders or directives through rest of this year and therefore are at a loss in telling customers not coming within the scope of the preferred tonnage programs, when orders now scheduled for fourth quarter will be shipped. This situation has resulted in further confusing the production outlook among many metalworking companies. Automobile production, for example, probably will be adversely affected next quarter, due to rated tonnage mills must get out or other programs. Little galvanized sheet production is expected next quarter for other than rated orders. Demand for drum sheets for domestic requirements is expected to exceed supply through first quarter. Further increase in the sheet and strip capacity is indicated in the proposed $24 million expansion by Tennessee Coal, Iron & Railroad Co. at Birmingham. Mills are not encouraging placement of last quarter tonnage, although some interests have accepted forward orders without commitment as to delivery.

**Cincinnati** — Sheet production in this district is at the peak for 1946 so far, mill interests aiming to hold the carryover into next quartter to a minimum. Fourth quarter outlook for sheets continues clouded by inability to estimate tonnage to be taken on directives. Even without intrusion of such tonnage, allotments would be considerably under needs. Most severe pinch is in cold-rolled and electrical sheets.

**Birmingham** — Sheet production is at virtual capacity but demand keeps well ahead. The scrap situation, under control by the largest producer, stands as a potential threat to production. The need for flat-rolled sheets for processing is exceptionally large as is that of roofing. Mills are producing some strip, most of in cotton ties.

**Boston**—Priority orders under CC ratings for fourth quarter delivery are coming through on cold-rolled strip in volume, notably for hinges and other builders' hardware. This will displace an equal volume tentatively scheduled for consumers not qualifying for ratings, thus increasing carryovers into next year. Cold strip mills are not getting the volume of hot-rolled material expected, notably in the low-carbon range, 0.50 or less. Higher carbon grades in some cases have been moved from October to next year. In view of unbalanced supply and depleted inventories rerollers are unable to schedule ahead, thus production and deliveries are erratic. The typewriter and office machine industry is hard pressed for narrow cold strip. Rated orders for sheets will cut shipments to many consumers next quarter and unless applied to warehouses, distributors are also likely to get less tonnage. Producers are filled with tempered strip orders in high-carbon ranges.

**Chicago** — The sheet situation grows tighter for fourth quarter with return of priorities, and one producer already has been obliged to reduce customers' quotas for this period by 25 per cent. Heavy carryover at yearend is certain, but can not yet be appraised. Books have not yet been opened for 1947, but some action in this direction may be taken in September. Consumers are most apprehensive over the future, lest there will be other encroachments on supply of sheets which will further decrease the quotas to them. The railroad have appealed to mills for assistance in obtaining modest quantities of galvanized sheets to repair box cars which must be kept in grain hauling service. The government's ordering 250,000 caskets for return of war dead, involving 50,000 tons of 16 and 18-gage sheets for delivery through 1947, is further upsetting the sheet picture.

## Tin Plate . . .

Tin Plate Prices, Page 157

**Pittsburgh** — A revision in Direction 9 to M-21 for fourth quarter is momentarily expected, which would reduce the tonnage of tin plate for containers for perishable foods, pharmaceuticals and related items to 70 per cent of monthly production. Easing in this regulation will make available more tin plate for B and C items. Seasonal food can requirements will diminish through the fall, and it also is pointed out that many can plants have undergone severe hardships in attempting to maintain output on their share of 15 per cent of tin mill products available for general distribution. There is little prospect that any conservation measures in the use of tin plate will be relaxed this year, because of the indicated continued shortage of pig tin.

Easing in car supply was just in time to prevent can manufacturers from tapering production, which would have seriously affected perishable food packing activity during this peak seasonal period.

Expansion in tin plate production facilities now under way is expected to be adequate to meet indicated increase of 20 per cent in can manufacturing over the next five years to about 20.5 billion units a year, in contrast to 17 billion prior to the war.

**Chicago**—Box car shortages continue to interfere with normal shipments of tin plate and from the situation is expected to grow more aggravated rather than improve. The critical point is likely to come in October and November. The delay in shipments comes when stocks of tin plate in hands of canmakers are said to be the lowest in many years.

## Steel Bars . . .

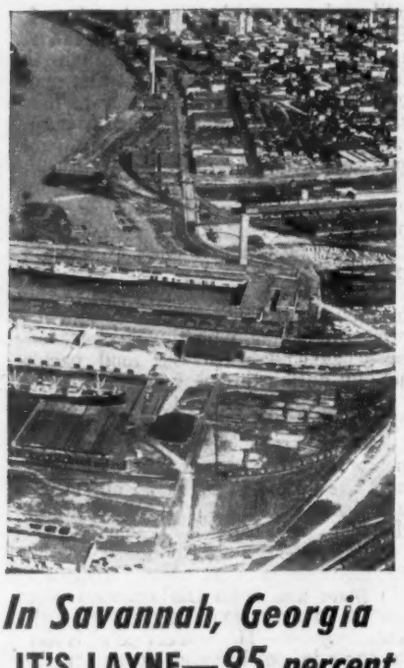
*First quarter books may be opened soon when certified tonnage is more definite; backlogs still heavy*

Bar Prices, Page 156

**New York** — Most bar sellers, it is believed, will open books for next year before the month is over. They expect shortly to be able to gage rather accurately as to what they may have in the way of carryovers at the end of this year and, therefore, what they may be able to promise for shipment in the early months of next year. Practically all producers are still well behind on current commitments, especially on small sizes, and there appears little doubt they will have a substantial carryover at the end of this year. However, until they have a better idea as to what they may be called upon to supply in rated tonnage for fourth quarter they cannot draw their estimates closely.

At present producers are unable to accept new tonnage for this year, except alloy bars, which they can furnish in liberal supply, and possibly some few of the larger sizes of cold-drawn bars.

**Pittsburgh**—No appreciable rated tonnage or directives for fourth quarter have been placed with producers to date, and although volume of this tonnage is expected to be fairly substantial, sellers are unable to determine specific delivery promises for consumers not coming within the scope of rated tonnage programs. Consumers, in turn, are unable definitely to fix production schedules for they have no assurance all tonnage on mill books now scheduled for fourth quarter rollings will be shipped. Mill carryover tonnage into fourth quarter is expected to represent about two months' output on an average, and is expected to include a relatively small amount of certified tonnage for September delivery.



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Most producers are discouraging ordering for first quarter, and are not scheduling any tonnage for that period until order backlogs are clarified in respect to volume of rated tonnage to be expected and likely amount of fourth quarter carryover.

**Philadelphia** — Small hot-rolled carbon bars, 1½-inches and under, appear about as scarce as anything in the whole steel category. Most mills are behind three to four months on current commitments, with order books crowded over the remainder of the year. On larger sizes producers are covered for 1946 but are not far behind on promises. Alloy bars are in free supply for fourth quarter.

## Steel Plates . . .

*Some producers are taking selected tonnages for 1947; export and ship repair orders being placed*

Plate Prices, Page 157

**Pittsburgh** — Mills report nearly two months carryover tonnage due to steel and coal strikes, which accounts for fact fabricators have not been able to make much headway against near record backlogs in recent months. Until nearly depleted fabricators' inventories can be augmented somewhat, miscellaneous tank, railroad car and barge construction will remain well behind schedule. However, increased output of plates at U. S. Steel's Geneva plant, scheduled for September, should ease the corporation's extended delivery commitments with eastern customers somewhat. One large interest reports September production schedules must be rejuggled again as result of an export directive for about 9000 tons. Mill deliveries generally are extended into December.

**New York** — Although some plate producers continue to enter tonnage for next year, they are doing so on a highly selective basis, and some are not accepting any tonnage. In general, they are concentrating principally on catching up on arrearages, and without much success in most cases, with output limited by shortage of pig iron and scrap. Some producers are at least three months behind on current commitments and one is behind almost four months.

September schedules have been set up to roll a limited tonnage of plates for export under the directive allocations announced a few weeks ago. So far nothing has been done with respect to export allocations of plates and other steel products generally for the closing month; however, it is believed there will be allocations for each month over the remainder of the year and that October allotments will be announced shortly.

The Maritime Commission has placed contracts with two yards in this district for the reconversion of two troop transport ships for passenger cargo service, one ship for each yard. Two other such contracts also have been placed, one with a Baltimore yard and the other with a shipbuilder in New Orleans.

**Philadelphia** — Plate production is being fairly sustained at the reduced rate prevailing over recent weeks, because of shortage of pig iron and scrap. Mills still have nothing to offer for this year, although some are accepting limited orders for first quarter of next year. All are still well behind on current commitments. American Locomotive Co., New York, will supply 700 tons of 48-inch steel pipe for the city of Philadelphia, award being made through Frank R. Curtis, Philadelphia, general contractor.

**Birmingham** — Pressure for plates has eased little and deliveries for the most part are several months delayed, with large backlogs into the new year a certainty. A general overall improvement, however, in output of plates is expected to have a wholesome effect on the situation by the end of the year, at the latest.

**Seattle** — Plate demand continues strong, tank jobs requiring most, but shops are handicapped by lack of material. Steel pipe contracts awarded months ago are still incomplete because plates have not been available. Northwest Marine Iron Works, Portland, Oreg., is low at $472,500 for a stern wheel all-steel tug for the port of Portland, requiring about 200 tons of plates. Bureau of Reclamation, Denver, will receive bids Sept. 10 for three 24-inch welded steel pipe connections and accessories for the Buffalo Rapids project in Montana.

## Wire . . .

Wire Prices, Page 157

**Boston**—Pressure on wire mills is increasing and inventories of more consumers are near exhaustion. Many are seeking to place orders for next year, some through 1947, but relatively little tonnage is being accepted on a firm basis. The automobile industry is asking for more wire for fourth quarter, including valve spring stock, and most suppliers to the industry who use wire are pressing for deliveries. Settlement of strikes in some cases revives demand. Mechanical spring requirements are also up. There is dearth of low-carbon material and users in some instances have changed specifications to higher grades in order to get supply. Shortage of upholstery wire in 11.5 gage is critical. Rod supply shows no improvement and allotments have been further reduced. Producers are drawing more finished wire and have less for nonintegrated mills. Inventories of screw stock are small as a general rule.

**Birmingham**—Even with virtual capacity production, wire is not sufficient to meet current needs. Added to the acute scarcity of nails is a growing lack of wire fencing, barbed wire and drawn wire for miscellaneous use. Jobbers in the immediate Birmingham district report virtually no stocks of merchant products.

**Chicago** — Most consumers of wire and wire products are disappointed over tonnages allocated to them. Among these are the automotive and bedding industries. Demand is extremely heavy for both high and low carbon grades, and the situation is particularly tight for diameters of 1/4-inch and smaller. Output of electrical wire and cable is restricted by copper shortage and customers are impatient over deliveries, being unable to fill old orders. All merchant products continue in tight demand, with nails, bale ties and tacks topping the list. Rumors of black market operations in nails persist, these including trading of nails for other tight construction items such as lumber.

## Structural Shapes . . .

Structural Shape Prices, Page 157

**Boston** — Restrictions on nonhousing construction are resulting in less inquiry, a situation expected to grow over the next few months. Fabricators have fair backlogs in small tonnage lots in this area, while larger shops are well filled with work for months. Plain material shipments are slightly heavier but deliveries on new inquiries are into second quarter on most smaller sizes. No bids were received for the 850-ton bridge at Hampton Harbor, N. H. Other bridge and highway work is being held up or delayed. An addition to the plant of the Pullman-Standard Car Mfg. Co. at Worcester, Mass., requires 100 tons.

**New York**—Included in the larger structural awards in this district recently are 4600 tons for a section of the west side elevated highway, placed through P. T. Cox Construction Co. Inc., with Harris Structural Steel Co., New York. Early action is also expected on approximately 5000 tons for the Lincoln housing project for the New York Housing Authority. New inquiry, hampered by various restrictions on non-housing construction, is light.

**Seattle**—Structural fabricating shops are making the best of a bad situation with steel allocations and deliveries far below current requirement. Inventories are extremely low and fabricators are cautious in making delivery guarantees in view of uncertain conditions.

**Chicago** — Because of the bad supply situation, most structural fabricators in this district are trying to avoid booking new business. Backlogs are heavy and mill shipments of material are falling behind quotas, indicating that many jobs booked earlier will suffer delay. In some instances, fabricators have been offered contracts with the buyer furnishing the steel, but this is not working out well. One structural mill in the district is preparing to reduce its quotas to customers 25 per cent in fourth quarter, this because of impact of the reimposition of priorities and already heavy carryovers.

**Philadelphia** — CPA restrictions on nonhouseing construction continue to hold much work in abeyance. During the period from Aug. 16 to Aug. 22, inclusive, the district CPA office, while approving 24 projects valued at $680,975 rejected 40 projects valued at $1,280,818. A few moderate-sized tonnages are being placed, with most fabricators booked well ahead and having considerable difficulty obtaining adequate coverage from shape mills.

## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 157

**Chicago** — The past week has been one of the quietest in many months as regards awards and inquiries for reinforcing steel. Production is far below overall requirements, and many construction jobs go begging. In one instance, a supplier is receiving only one-third of its quota, and has no idea how it will be able to satisfy the orders standing on its books orders placed before the situation worsened. The government's decision to cut back commercial construction approximately one-fourth to assist the veterans housing program will relieve some pressure, but not enough.

**Seattle** — Mills have backlogs reaching to the end of the year and are not booking business except in small tonnages for regular customers. Books for 1947 will not be opened until fourth quarter. Reinforcing bar business pending includes more than 100 tons for Washington state bridges, bids Sept. 4, about 100 tons for a warehouse at Vancouver, Wash., and an unstated tonnage for a cannery plant at Portland, Oreg. Much potential business awaits placement.

**Philadelphia** — The leading Pittsburgh producer of reinforcing bars has advised distributors in the Philadelphia district he will no longer service them after the end of this year. It is understood the same word has gone out to jobbers in Baltimore and Washington. While there has been no official explanation it is assumed in the trade that the action was prompted in large measure by the freight rate absorption necessary in shipping this low-profit item into these districts. This leaves the servicing largely up to one eastern producer.

## Rails, Cars . . .

Track Material Prices, Page 157

**New York** — A leading car order involves 1000 freight cars for the Nashville, Chattanooga & St. Louis, placed with the Pullman-Standard Car Mfg.

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Co.'s plant at Bessemer, Ala. While bookings probably were not as heavy in August as in July, when more than 15,000 freight cars were placed by domestic lines, a substantial total will undoubtedly be reported. Meanwhile, September is starting with some sizable lists on inquiry.

Recent locomotive buying is featured by twenty-three 1500-horsepower diesel electric freight engines placed with American Locomotive Co., New York, by Gulf, Mobile & Ohio; 22 similar units have recently been delivered by this builder to this road.

**Philadelphia** — The Pennsylvania Railroad will start early next year on construction in its own shops of 1100 box cars. Except for underframes and trucks these will require about 12,000 tons of steel, with some protection against this tonnage already received.

**Pittsburgh** — To break the bottleneck in freight car construction, CPA is considering issuing directives to speed flow of scarce materials needed for the repair of 80,000 freight cars and construction of 40,000 new ones this year. Official figures as to the amount of steel needed for this program are not available, although it is estimated that around 300,000 tons of steel will be required for repair purposes and about 700,000 for construction of new ones. Steel items involved would include plates bars, sheets, wheels and axles. The 36,750 cars ordered by France are the chief bottleneck in preventing freight car builders to increase output of domestic cars.

Effective midnight Aug. 31, Carnegie-Illinois Steel Corp. will increase the price of one-wear freight car wheels $3.70 per wheel. On Type A-33 (as incorporated in the new designs effective Aug. 1) for 50-ton cars or less, the new price will be $27.50; price for Type B-33 for 70-ton cars will be $29.50.

## Pig Iron . . .

*Supply improves slightly but scrap shortage limits foundry melt; inventories reduced to minimum*

Pig Iron Prices, Page 159

**Philadelphia**—In contrast to certain other areas on the eastern seaboard, the Philadelphia district reports an increase in foundry melt for August. This is ascribed to the fact there is more certified production in the Philadelphia area, especially in pressure and soil pipe and sanitary ware required for the national housing program. September is expected to be about on a parity, if not more active, as pig iron supply may be slightly heavier, with possibly some betterment in flow of scrap, although this is problematical.

A complicating factor is increasing scarcity of coke. Some leading producers of by-product coke are setting up allocations based on 1945 shipments and this obviously will not be enough in many cases as foundries generally have more work on their books than a year ago and a number, further, will be squeezed by diversion of coke to foundries engaged in preference work. Coke sellers, it is thought, will see that the latter companies receive an adequate supply. Contributing to the shortage is heavier output of foundry iron, which requires more fuel in its production than basic iron. One district furnace, after spending the last two weeks of August on basic, is back on foundry iron.

**New York** — District foundry melt in August was down from the preceding month, according to present indications. Pig iron shipments were up slightly, but most consumers did not have even the inventory to draw upon that they had in July, and, moreover, were unable to obtain as much scrap as in July. Another complicating factor last month was increasing scarcity of coke, especially in the last two weeks. Some trade leaders doubt if September melt will show improvement; others, though, believe that there will soon be a breaking of the price deadlock on scrap, which should stimulate flow of that material somewhat, and that production of pig iron will steadily rise.

Some trade leaders estimate that pig iron production in August amounted to about 4,800,000 tons for the country as a whole, which would compare with 4,650,042 tons in July, as currently reported by the American Iron and Steel Institute.

**Pittsburgh**—Foundry interests do not expect improvement in pig iron supply through the rest of this quarter, which means many will have to sharply curtail operations and in a few instances close their plants, as they are drawing heavily on inventories. The merchant producer here reports certified tonnage obligations have been increased for September, due to receipt of late applications. It is not known yet to what extent certified tonnage requirement will absorb fourth quarter pig iron production although there is some prospect that overall tonnage may be reduced because of acute hardship imposed on those foundries serving automotive and other important industries not coming within the scope of CPA's certified tonnage program. These interests are seeking a limit to tonnage shipped under this program. At present nearly 50 per cent of the 350 000 tons of merchant pig iron channeled to foundries monthly is being certified. Necessity of the Kaiser-Frazer Corp. to lease for three years the high-cost Anna furnace of Struthers Iron & Steel Co., Youngstown, is indicative of the overall critical pig iron shortage. The furnace has been idle since last fall. Supplies of coke, iron ore and limestone have been made available with result operations already are under way. The operating arrangement do not involve a government subsidy.

**Boston**—As most larger consumers do not qualify for certified tonnage this group is notably affected by growing shortage of iron. Melt continues to decline in most gray iron shops, but holds relatively well in malleable foundries. Some of the latter have certified orders. Steelworks depend on week to week deliveries, which are hampered from Buffalo by railroad car supply. Prospects for resumption by Mystic blast furnace are not bright.

**Buffalo** — Although merchant iron producers report current record-breaking output is being spread in an effort to satisfy customers, complaints continue to accumulate from melters who claim that operations are being curtailed, or checked by insufficient iron. Sellers admit frankly that current theoreti-

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cal capacity operations fail to cone with increased demands from foundries. In maintaining brisk operations, producers are confronted by a constant coke supply problem. A producer who is operating all of his furnaces reports that one unit is kept going with coke allocated from another one of the same company's furnaces located elsewhere which is down for relining. Certified tonnage continues to run close to sellers' already planned delivery schedules.

**Chicago** — Foundries have given up hope for the present of obtaining increased supplies of raw materials, principally pig iron, coke and scrap. Allocations of iron are under tight control, but the tonnage is far under that needed to maintain operations at a high level. Priority assistance to those shops making castings needed in the veterans housing program serves only to restrict operations of other shops unable to get preferential treatment, because overall iron supply remains fairly constant. In this district, 37 of 41 blast furnace continue to operate. bulk of output is basic iron for steelmaking.

**Cincinnati**—Foundries in this district are hard pressed for pig iron, scarcity of supplies acting as a curb on the melt. However, shipments for August were heavier than some feared when CPA directives took such a large part of southern iron. Furnace representatives were hazy regarding the outlook for September.

**Birmingham** — The pig iron situation remains as unsatisfactory as ever. Bearing out earlier expectations, merchant melters estimate that shipments to foundries are hardly 50 per cent of regular quotas. A considerable portion of the district's output is still being moved through certification.

## Scrap . . .

*Shortage still acute with tonnage held back until price deadlock is broken; inventories are low*

**Scrap Prices, Page 160**

**Boston**—Movement of all grades of scrap to consumers is light as the matter of price tends to stalemate yard tonnage until the question of any possible increase is clarified. In some instances yard supplies are heavier than in weeks as consumers, both foundries and steelworks, draw on already dangerously low reserves. Bids by dealers for prepared heavy melting steel, Boston Navy Yard accumulations to Nov. 1, were well over ceiling, at $16.37 for No. 1, while unprepared brought a bid of $14.35. Since the ruling forbids dealers paying over ceiling for prepared scrap, new tenders may be taken. However, this figure was bid before the ruling, which became effective Aug. 26. Ceiling for No. 1 prepared heavy melting steel is $15.05.

**Pittsburgh** — Scrap shipments have shown no improvement and are not likely to until the price question is permanently settled. Industry members met with OPA officials in New York last week to point out their reasons for a request of $3.50 per ton increase. Included in the discussion at this meeting was the matter of increasing the dealers' spread for handling unprepared material from $3.50 to $5 per ton to offset higher labor costs, increased freight rates on shipments to yards from producing points and necessity to rely more and more on remote areas for collection of badly needed scrap. Steel ingot has declined slightly the past two weeks, but is still close to capacity. Mills are drawing heavily on inventories, which are somewhat larger than in other districts. Considerable scrap is going direct to mills from fabricators, with large shipments from automotive plants cited. Reports continue of upgrading scrap, with No. 2 heavy melting selling as low phos, etc. Alloy contamination and high handling charges are chief deterrents restricting increased movement of battlefield scrap to this country. One large interest is said to have accumulated a large tonnage of this type of scrap, but to date has been unable to effectively utilize it because of high alloy content.

**Buffalo** — With the short scrap supply becoming more desperate, increased pressure is reported for reciprocal deals between consumers and supply sources, bypassing the dealer. Pig iron also was reported moving to a buyer in return for blast furnace scrap. Dealers find railroad lists are not averaging more than 25 per cent of normal. The poor tonnage on industrial lists is attributed to delays in full motor output, but one leading dealer reports efforts to establish reciprocal deals are rejected. Dealers continue to await higher OPA ceilings, but deny allegations that large amounts of scrap are being held back pending the price action. Breaking the unusual lull in water receipts for this time of the year, a boatload of 2200 tons of cast scrap has arrived from Michigan.

**Cincinnati** — Nothing has developed in this district to alleviate anxiety about scarcity of iron and steel scrap. Mills are either depending on current shipments, because of exhausted reserves, or digging more deeply into stockpiles. The foundry melt is being curtailed by the double shortage of scrap and pig iron. Brokers and dealers are under constant pressure for deliveries to consumers.

**Birmingham** — While scrap scarcity has not thus far forced actual closing of any furnaces, that move is considered inevitable in the long run. Considerable trading between soil pipe people and those with scrap is reported and that, to an extent, further demoralizes the situation.

**Seattle** — Scrap shows no improvement and receipts continue less than consumption. No more shipyard material is available and country shippers are holding back because they claim ceiling prices give too narrow a margin in view of labor scarcity and high wages.

**New York** — There is likely to be a shortage of scrap for some time, but probably not as pronounced as it has been. Meanwhile, pending word as to the expected advance in ceiling on prepared grades scrap shipments are being held up at many points, in some cases with material already on cars. Aware of this situation and not disposed to retroactive action while the study is being made OPA is centering immediate attention on establishment of higher prices.

A moderate price increase is expected

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to reduce bartering, upgrading and other measures taken over recent weeks as the scrap shortage increased, to circumvent ceilings. Higher prices are expected to give impetus to scrap movement, which in some areas has dropped 50 per cent in recent weeks, in hope of higher prices.

**Chicago** — Short supplies of scrap serve as a constant threat to steelmaking operations. During the past week receipts came close to consumption, but when deficiencies occur inventories are dipped into. So long as shipments continue to match melting requirements maximum output can be maintained, but fear is that stocks may become exhausted and with this cushion, small as it is, gone, shrinkage of intake will interfere with operations. Feeling is growing that favorable action by OPA on a price increase will stimulate the production of scrap. Fact that flow has held its own the past week or two is attributed to a higher production of scrap by manufacturing industries rather than more activity in searching out country scrap. Volume of the latter is almost negligible.

## Warehouse . . .

Warehouse Prices, Page 158

**Pittsburgh** — Some increase in overall mill warehouse shipments occurred this month, but the improvement has not been uniform between warehouses or as to specific steel products. Warehouse steel stocks continue nearly depleted in light gage sheets and galvanized items, small angles, wide flange beams and channels. Many warehouse customers continue to operate well below capacity, due to critical shortage of many steel items and in spite of fact they frequently accept substitute specifications. Although distributors have no preferred status under CPA's fourth quarter rated tonnage program, most warehouse interests believe some form of a mill warehouse load directive will be necessary to meet minimum essential needs of customers. Under present set-up it is believed doubtful mills can maintain present volume of warehouse steel shipments in light of anticipated heavy volume of rated tonnage for fourth quarter.

**Seattle** — Jobbers are in receipts of steady demand for all classes of steel, with nails, galvanized sheets and some other materials in short supply and in some cases unavailable. Prices are unchanged.

**Cincinnati**—Some improvement in mill shipments enabled warehouses to lift sales volume in August. Customer pressure continues unabated on small bars, structurals and sheets but replacement of these items is so laggard that inventories are almost continously exhausted.

**Philadelphia** — Some leading Philadelphia jobbers report that incoming and outgoing tonnage in August was heaviest so far this year. Also they look for a good month in September. They are less certain, however, as to prospects in fourth quarter, with Direction 12 expiring Sept. 30. Under this order mill tonnage is being received in the current quarter and is working out satisfactorily, according to most jobbers. Scarcity of small bars and angles and in most grades of sheets prevails, because of unusually heavy demand.

**Chicago** — Each passing week finds warehouses losing ground in their inventory position. Receipts fall short of sales, reducing stocks of some products, particularly flat-rolled, to near exhaustion levels. Some distributors who depend upon eastern mills for bulk of their material have suffered cuts in quotas. Outlook for balance of the year is definitely discouraging.

## Nonferrous Metals . . .

Nonferrous Prices, Page 162

**New York** — Ceiling price increase of ¼-cent per pound on four grades of brass and bronze ingot to cover higher scrap costs has been granted. These are the red and yellow brass and bronze groups 88-10-2 and 80-10-10. Supplies of major nonferrous metals are tight and basis industries using them are confronted by continued shortages, including automotive, housing and electrical. Foreign copper has sold abroad equivalent to 16.75 cents fas Atlantic ports, with demand active, compared with 15⅜ cents here. Northern Rhodesian production has been resumed after strikes. Stockpile of copper here has been reduced to 264,849 tons as of Aug. 1, a decline from 323,101 tons the previous month. Consumption in July was 96,743 tons, compared with 91,586 tons in June. Considering the stoppages the average of 87,815 tons consumed monthly thus far this year is good. For seven months consumption was 614,709 tons.

Limited tonnage of high grade zinc has been authorized for release to consumers. This action follows the practical withdrawal of some producers from the market because of prices. Zinc stockpile approximates 202,685 tons, 141,866 tons being regular high grade. Monthly output has been 31,416 tons below estimated monthly consumption of 72,000 tons. Price currently is the confusing factor in zinc, both in production and distribution. Release of regular high grade may help brass producers but not galvanizers.

Higher prices for foreign concentrates is affecting offerings here. September zinc releases will approximate 40,000 tons, including 20,000 tons of foreign and Reserve metal. Here, again, process are affecting offerings and lead produced from concentrates and scrap obtained in July on the 9.50-cent basis is not available.

Stockpile of tin is heavier, 58,490 tons Aug. 1, compared with 54,852 tons the previous month. Of this, 27,296 was in pig tin and the remainder ores and concentrates.

## Semifinished Steel . . .

Semifinished Prices, Page 156

**Pittsburgh** — Deliveries are extended into March next year on export tonnage and these commitments would be greater if mills were to book all inquiries offered. Most producers do not have sufficient billet mill capacity to operate bar mills at desired pace. Critical shortage of wire rods continues to restrict output of nonintegrated wire producers, although supply has improved somewhat recently for interests in New England area. Tight supply situation in sheet bars should be eased considerably as result of the government's subsidy program under which 205,000 tons are scheduled to be produced by Sharon Steel Corp. and Jones & Laughlin Steel Corp. for four nonintegrated sheet mills.

## Beehive Oven Coke Prices At Foundry Level Revised

Coke Prices, Page 157

**Pittsburgh** — Increased prices of $1.25 and $1.35 a ton on Connellsville district machine and hand-drawn beehive furnace coke, respectively, announced recently by OPA, also are applicable on foundry coke in that area as well as on both classifications in New River and Wise county districts.

The market on machine-drawn beehive foundry coke in Connellsville district is now $9.75 to $10 per net ton; New River county, $10.25 to $10.50; Wise county, $9 to $9.50. Beehive furnace coke in Wise county is quoted at $8.50 to $9 per net ton.

The price increases are retroactive to May 17 on those contracts which were made on adjustable pricing basis as permitted under order 18 issued by OPA May 17 in accordance with section 3 of MPR-77.

Coke production continues at near capacity pace although freight car shortage is retarding coal output, as much as 50 per cent at some mines, which will soon adversely affect coking operations unless remedied. Coke stocks at foundries and steel plants are well below normal but adequate to meet current needs if incoming receipts are maintained. Chief concern at the moment is the critical pig iron shortage.

High-production cost producers who are unable to recover total costs at the new level are permitted to apply for individual adjustments if they can qualify under the beehive oven coke regulation.

At the same time OPA provided that resellers may establish their ceiling prices on the basis of their average current costs of acquisition plus the average percentage discount or mark-up in effect March 31, 1946. However, this applies only to beehive oven coke other than furnace coke produced in the Connellsville district and other than foundry coke produced in Fayette and Nicholas counties, W. Va. Distributors of such coke have been excluded because the maximum prices on March 31 did not provide for any margin for their sales. Flat dollar-and-cent ceiling prices were fixed for all sellers so that distributors could buy and resell only because of price concessions granted by their suppliers.

## Bobbi Car Company To Move Operations to Birmingham

Bobbi Motor Car Corp., San Diego, Calif., manufacturer of small automobiles, has taken a five-year lease on 700,000 sq ft of space at the former Bechtel-McCone Corp. plant at Birmingham to which Bobbi will move its entire operations.

When in full production the plant is expected to employ between 10,000 and 12,000 workers and to manufacture 200,000 cars annually. Moving of machinery to Birmingham is to be started immediately, and it is expected that floor samples of the car will be ready within three or four months. The car is to retail at about $700. A world-wide dealer organization has been set up and millions of dollars worth of orders are available, according to S. A. Williams, president of the Bobbi company.

The two score industries now located in the former Bechtel-McCone plant will not be affected, some of them being in position to manufacture components for the Bobbi car.

## Union Pacific Prepares For Heavy Geneva Traffic

Union Pacific Railroad's president, George F. Ashby, on a visit to Salt Lake City recently disclosed preparations of the road to serve an increased rate of operations at the Geneva steel mill in Utah.

Union Pacific, reported Mr. Ashby, will purchase 100 open-top all-steel gondolas, costing $5 million, and will use them to haul raw materials to the Geneva plant and to carry finished products away.

Mr. Ashby also said the railroad is encouraging private development of trona (soda ash) deposits in Wyoming with the idea that this development could be integrated with Utah's steel industry. He forecast that the trona development is potentially the forerunner of an important chemical industry in western Wyoming.

## 8½-Mile Tunnel Considered For Cascade Mountains

*OLYMPIA, WASH.*

Officials of Washington state are studying plans for a proposed 8½-mile tunnel through the Cascade mountains, the design having been submitted by C. P. Rollins, Seattle engineer. The cut would reduce distances from Puget Sound to eastern Washington by 10 to 20 miles.

The plans call for a two-lane vehicular bore paralleled by a 16-foot railroad tunnel. No estimate of the cost has been calculated.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

23,350 tons, sheet rolling mill, Bettendorf, Iowa, for Aluminum Company of America, to Bethlehem Steel Corp., Bethlehem, Pa.

4600 tons, section of west side elevated highway, New York, through P. T. Cox Construction Co. Inc., general contractor, to Harris Structural Steel Co., New York.

1800 tons, board plant, Johns-Manville Co., New York, for construction at Natchez, Miss., through Ford, Bacon & Davis, New York, to Ingalls Iron Works, Birmingham, Ala.

1700 tons, power plant, American Gas & Engineering Service Corp., Brilliant, O., to American Bridge Co., Pittsburgh.

1000 tons, brewery, National Brewing Co., Baltimore, through Consolidated Engineering Co., Baltimore, to an unstated fabricator.

580 tons, ten garages various locations in state of New York, to White Plains Iron Works, White Plains, N. Y.

500 tons, sheet piling, Cherry Creek dam, Denver, to Carnegie-Illinois Steel Corp.,

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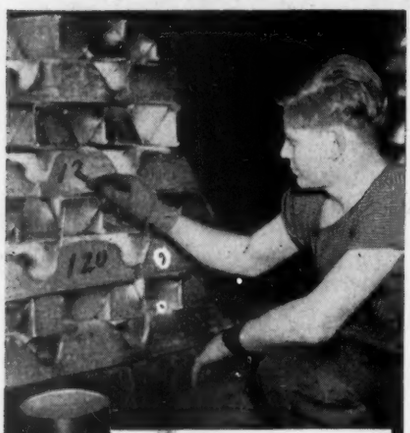

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Chicago; David Gordon Bldg. Co., Denver, contractor; bids June 18.

500 tons, du Pont chemical plant, Toledo, O., to Clinton Bridge Works, Clinton, Iowa.

425 tons, addition for Boston Woven Hose & Rubber Co., Cambridge, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; F. Leroy Fox Inc., Cambridge, general contractor.

415 tons, bumper plant addition, Saginaw, Mich., for General Motors Corp., to Whitehead & Kales Co., Detroit.

410 tons, soldiers' home, Chelsea, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; M. S. Kelliher Co., Boston, general contractor.

400 tons, New York Central bridge, Little Falls, N. Y., to American Bridge Co., Pittsburgh, through Walsh Construction Co., New York, general contractor.

400 tons, hangar, Atlanta, Ga., to Lehigh Structural Steel Co., Allentown, Pa.

310 tons, sheet piling, breakwater, Michigan City, Ind., for Northern Indiana Public Service Co., to Carnegie-Illinois Steel Corp., Chicago.

260 tons, warehouse, Radville Oil Co., Philadelphia, through Frank J. Larkin, that city, to Lehigh Structural Steel Co., Allentown, Pa.

250 tons, woodworking plant for York Corp., York, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

165 tons, addition for Pneumatic Scale Co., Norfolk Downs, Quincy, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; George A. Fuller Co., Boston, general contractor.

### STRUCTURAL STEEL PENDING

2500 tons, research buildings, du Pont interests, New Bridge, Del.

900 tons, plant additions for Parish Pressed Steel Co. Division of Spicer Mfg. Co., Reading, Pa.

750 tons, station platform extensions, New York City Board of Transportation; bids Sept. 16.

400 tons, New York Central bridge, Little Falls, N. Y., Walsh Construction Co., New York, low on general contract.

308 tons, overpass, Clifton, N. J.; bids Sept. 17, Spencer Mill Jr., state highway commissioner, Trenton.

125 tons, state highway bridge, Carbon county, Pennsylvania.

100 tons, dairy plant for Cooklyn Milk Co., Philadelphia.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

300 tons, addition, Chicago, for Regensteiner Corp., to Joseph T. Ryerson & Son Inc., Chicago.

### REINFORCING BARS PENDING

650 tons, water filtration plant, Hammond, Ind., for city; Joseph J. Duffy Co., Chicago, low on bids Aug. 10; bids rejected, new bids to be asked.

300 tons, clay drying and rock crusher building, Dixon, Ill., for Medusa Portland Cement Co.; Hunken-Conkey Co., Cleveland, contractor.

100 tons, overpass, Clifton, N. J.; bids Sept. 17, Spencer Miller Jr., state highway commissioner, Trenton.

100 tons, warehouse, Vancouver, Wash.; contract to Heinrichs, Beedle & Hearne.

Unstated tonnage, plant for Starr Fruit Products Co., Portland, Oreg.; bids soon.

## PIPE . . .

### CAST IRON PIPE PENDING

300 tons, various sizes, for Vancouver, Wash.; bids Aug. 28.

## PLATES . . .

### PLATES PENDING

200 tons or more, steel tug for Port of Portland, Oreg.; Northwest Marine Iron Works, Portland, low at $472,500.

Unstated tonnage, three 24-inch welded steel connections for Buffalo Rapids project, Montana; bids to Bureau of Reclamation, Denver, Sept. 10.

## RAILS, CARS . . .

### LOCOMOTIVES PLACED

Gulf, Mobile & Ohio, twenty-three 1500-horsepower diesel-electric freight locomotives, to American Locomotive Co., New York.

Kansas City Southern, one 8000-horsepower 4-unit diesel-electric freight engine, to Fairbanks, Morse & Co., Chicago.

Kansas City Southern, 19 diesel-electric locomotives to locomotive division of General Motors Corp., La Grange, Ill.; includes twelve 1000-horsepower switch engines, five 6000-horsepower, 4-unit freight engines; and two 3000-horsepower, 2-unit passenger locomotives.

### RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 1000 all-steel box cars, to its own shops; 750 additional cars are yet to be placed.

Baltimore & Ohio, 1000 fifty-ton box cars, to Pressed Steel Car Co., Pittsburgh.

Nashville, Chattanooga & St. Louis, 1000 fifty-ton all-steel freight cars, to Pullman-Standard Car Mfg. Co., Bessemer, Ala., shops; includes 500 box cars, 200 gondolas and 300 hoppers.

Pennsylvania Railroad, 1100 box cars, to own shops for 1947 construction.

# CONSTRUCTION AND ENTERPRISE

### ALABAMA

MOBILE, ALA.—Tennessee Valley Authority, New Sprankle Bldg., Knoxville, Tenn., plans a phosphate fertilizer plant, to cost about $3 million.

### CALIFORNIA

COMPTON, CALIF.—E. R. Parker, 135 East Palmer St., will build a machine shop 68 x 120 feet at 401 East Pine St., to cost about $15,000.

LOS ANGELES—De La Mar Bed Spring Co., 1634 Nadeau St., has permit for a plant addition, to cost about $8200.

SANTA CLARA, CALIF.—Blow-Knox Corp., Pittsburgh, has plans for a plant on 26-acre site north of here, for manufacture of food processing equipment and earth moving machinery, to cost about $1 million.

SOUTH GATE, CALIF.—Pacific Cast Iron Pipe & Fittings Co. has building permit for a monorail superstructure at its plant at 9430 Rayo Ave., to cost about $5000.

### CONNECTICUT

SPRINGDALE, CONN. — Stamford Rolling Mills, Springdale, has plans for a steel and concrete plant addition, to cost about $150,000.

### GEORGIA

ALBANY, GA.—City has let contract to Stacey Dresser Engineering Co., Cleveland, division of Stacey Bros. Gas Construction Co., Cincinnati, for design and construction of a propane-air gas plant, with capacity for 312,000 cubic feet per day, including unloading and storage facilities for liquified propane.

### ILLINOIS

ALTON, ILL.—Illinois Power Co., 135 North Main St., Decatur, Ill., has plans for a generator plant with capacity of one billion kw

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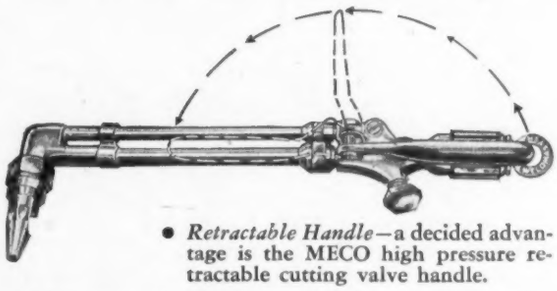

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hours per year to cost about $17 million.

CALUMET CITY, ILL.—B. F. Goodrich Co., 333 West Lake St., Chicago, is having plans drawn for a one-story rubber reclamation plant.

CHICAGO—Leishern-Sobel Steel Co., 4914 South Wentworth Ave., plans a one-story 60 x 200-foot warehouse to cost about $200,000. A. Epstein, 2001 West Pershing Rd., is architect.

SKOKIE, ILL.—Public Service Co. of Northern Illinois, 72 West Adams St., has let contract to W. E. Schweitzer Co., 2207 Dodge Ave., Evanston, Ill., for a gas plant addition, to cost about $185,000.

WINCHESTER, ILL.—Illinois Rural Electric Co., S. R. Faris, manager, plans a generating plant addition and a 1050 kva unit, general contract to Busch-Sulzer Bros. Diesel Engine Co., 3300 South Second St., St. Louis, to cost about $175,000. Stanley Engineering Co., Muscatine, Iowa, is engineer.

## INDIANA

FORT WAYNE, IND.—Indiana Service Corp., 2101 Spy Run St., C. V. Sorenson, president, plans a 45,000 kva substation and high-tension lines, to cost about $1 million.

INDIANAPOLIS—Radio Corp. of America, Cooper and Front Sts., Camden, N. J., plans a one-story 36 x 452-foot plant addition costing over $200,000. F. W. Daniels, 1650 Hanna Bldg., Cleveland, is consulting engineer.

INDIANAPOLIS—Public Service Co. of Indiana, Traction Terminal Bldg., R. A. Gallagher, president, plans a power plant addition at Edwardsport, Ind., including 37,500 kw generator, to cost about $5 million, and a steam generating plant at Terre Haute, Ind., with capacity of 300,000 pounds hourly, to cost about $1,500,000. Sargent & Lundy, 140 South Dearborn St., Chicago, are consulting engineers.

## IOWA

OTTUMWA, IOWA—Iowa Southern Utilities Co., E. Schutts, Centerville, Iowa, in charge, plans a power station costing about $1 million. Federal Engineering Co., 505 Putnam Bldg., Davenport, Iowa, is consulting engineer.

## MASSACHUSETTS

PITTSFIELD, MASS.—General Electric Co., Morningside, plans a brick and steel plant addition costing about $850,000.

WEST LYNN, MASS.—General Electric Co., River Rd., Schenectady, N. Y., has let contract to Turner Construction, 420 Lexington Ave., New York, for a manufacturing building to cost about $500,000.

## MICHIGAN

ADRIAN, MICH.—Aget Mfg. Co., 1408 East Church St., has been incorporated with $50,000 capital to manufacture metal products, by Harry L. Gilmore, 635 West Maumee St.

BATTLE CREEK, MICH.—A. B. Stove Division of Detroit Michigan Stove Co., 6900 East Jefferson Ave., Detroit, is having plans drawn by L. J. Sarvis, Battle Creek, for a plant addition costing about $135,000.

DEARBORN, MICH.—Mohawk Metal Forming & Tool Corp., 1330 Industrial Ave., has been incorporated with $55,000 capital to manufacture tools, jigs, dies and mechanical devices, by Jack Schmelz, Highland Park, Mich.

DETROIT—Budd Wheel Mfg. Co., 12141 Charlevoix Ave., plans a foundry plant addition, to cost about $95,000.

DETROIT—Revere Products Inc., 9145 East Forest Ave., has been incorporated to manufacture gas burners and parts, with $50,000 capital, by Roger H. Poirier, 9351 Elsa Ave.

DETROIT—General Instrument Corp. of Michigan, Dime Bldg., has been incorporated with $250,000 capital and 250 shares no par value to manufacture machines, tools and equipment, by George B. Mullin, 15848 Kentucky Ave.

DETROIT—Bower Roller Bearing Co., 3040 Hart Ave., has let contract to the Austin Co., 227 Curtis Bldg., for design and construction of plant additions, to cost about $500,000.

DETROIT—Active Industries Inc., 888 Clairpointe, has been incorporated to manufacture farm equipment, by Henry Drettman, 706 Westchester, Grosse Pointe, Mich.

DETROIT—Autometric Tool & Mfg. Co. Inc., 10317 Northlawn Ave., has been incorporated with $50,000 capital to manufacture tools, dies, jigs and fixtures, by Frank J. Jankiewicz, 8360 Almont St.

DETROIT—Industrial Engineering & Tool Co., 1520 David Stott Bldg., has been incorporated to manufacture electric motors and appliances, by Martin Silvers, same address.

DETROIT—Horvath Tool & Mfg. Co., 10210 Plymouth Rd., has been incorporated with $50,000 capital to manufacture tungsten carbide tools, by Paul M. Horvath, 2135 Hubbard St.

DETROIT—Schultes Level Inc., 3377 Gratiot Ave., has been incorporated with $50,000 capital to manufacture aluminum levels, by John Schultes, 564 Bellevue Ave.

DETROIT—Hawthorne Metal Products Co., 18350 Hawthorne St., is having plans made for a plant and office building, to cost about $250,000. C. W. Brandt & Associates, 1418 Woodward Ave., Royal Oak, Mich., are architects.

FLINT, MICH.—Dew Mfg. Co., 1613 Industrial Ave., has been incorporated with $50,000 capital and 50,000 shares no par value, to manufacture tools, dies and jigs, by Eldon A. Desermeau, same address.

FRASER, MICH.—Fraser Mfg. Co., 4996 Mulvey Rd., has been incorporated with $30,000 capital to manufacture cast iron pulleys and rakes, by Paul C. Kuehn, Box 207, Fraser.

HAMTRAMCK, MICH.—Quick Tool & Gage Co., 12031 Mitchell St., has been incorporated with $100,000 capital to manufacture tools, dies, jigs, fixtures and machinery, by Richard A. Connell Jr., Whittier Hotel, Detroit.

## MISSOURI

ST. LOUIS—C. Hager & Son Hinge Mfg. Co., 2451 Dekalb St., has let contract to Fruin-Colnon Contracting Co., 1706 Olive St., for a one-story 150 x 290-foot plant building, to cost about $100,000. Maura, Russel, Crowdell & Mullgadt, 721 Olive St., are architects.

ST. LOUIS—Monarch Weather Strip Co., 6333 Etzel Ave., has let contract to I. E. Millstone Construction Co., 4343 Clayton Ave., for a one-story 50 x 180-foot addition to weather strip manufacturing plant, to cost about $55,000.

## NEBRASKA

OMAHA, NEBR.—City has plans under way for a sewage disposal plant to cost about $6 million.

## NEW JERSEY

TRENTON, N. J.—Columbian Carbon Co., 601 Cass St., is having plans drawn for a four-story 112 x 159-foot plant addition, to cost about $275,000. A. K. Bugbee & Co. Inc., Normal Ave. and Oakland St., is consulting engineer.

## NEW YORK

HEMPSTEAD, N. Y.—General Bronze Corp., 34-19 Tenth St., Long Island City, N. Y., has plans for a plant to cost about $2 million. S. L. Strauss, 70 East 45th St., New York, is architect.

WOODSIDE, N. Y.—Electrical Fittings Corp., 30-45 Star Ave., Long Island City, N. Y., has plans for a factory building at 38th Ave. and 56th St., to cost about $125,000.

## NORTH DAKOTA

DEVILS LAKE, N. DAK.—Otter Tail Power Co., Fergus Falls, Minn., plans expansion of power plant here at cost of about $800,000.

## OHIO

CLEVELAND—Glatther Lighting Co., 943 East 72nd St., has been formed by Carl F. Glatther and will manufacture lighting fixtures as soon as equipment has been installed, a plant with 15,000 square feet floor space being available.

CLEVELAND—Neo Blast & Metallizing Inc. has been formed to acquire assets of former Neo Mold Co., 2160 East Eighteenth St. Equipment will be moved to a 50 x 100-foot building at 2181 East Eighteenth St. where blasting and metallizing will be done. R. J. Richards is president.

ELYRIA, O.—American Radiator & Standard Sanitary Co., Bessemer Bldg., Pittsburgh, has plans for expansion of its steel furnace division, at cost of about $250,000.

WILLOUGHBY, O.—Willoughby Machine & Tool Co., Elm and Church Sts., plans a plant addition to cost about $100,000.

## OREGON

PORTLAND, OREG.—Willard Storage Battery Co. has let contract to Donald M. Drake for a 150 x 360-foot steel and concrete plant.

## PENNSYLVANIA

PHILADELPHIA—American Oil Co., Grays Ferry Ave., is having plans drawn for a bulk oil distribution terminal costing about $500,000. G. Blatchley, American Bldg., Baltimore, is engineer.

PITTSBURGH—American Cladmetals Co., Grant St., is having plans drawn for a one-story plant addition and alterations, to cost about $1,200,000, with equipment.

READING, PA.—Parrish Pressed Steel Co., Weiser and Robeson Sts., is having plans drawn for a plant addition to cost about $350,000.

## SOUTH CAROLINA

GREENVILLE, S. C.—Mountain City Foundry & Machine Co. will build additions increasing capacity from 10,000 to 75,000 square feet floor space, at cost of about $100,000.

## TEXAS

CARROLTON, TEX.—National Metal Products Co., J. Curtis Sanford, Merchants Bank Bldg., in charge, has plans for a plant unit costing $225,000, rolling mill costing $175,000 and tube mill costing $125,000.

DALLAS, TEX.—Dallas Power & Light Co. plans installation of an additional turbo-generator unit to double generating capacity of Mountain Creek Plant, at cost of about $3 million.

FORT WORTH, TEX.—Tarrant County Water Control & Improvement district No. 5 has FWA funds for sewage treatment plant to cost about $125,000.

PORT ARTHUR, TEX.—U. S. Steel Products Co., Port Arthur, plans erection of a plant building for manufacture of steel drums, to cost about $1 million.

## WISCONSIN

WEST BEND, WIS.—Pick Industries Inc., West Bend, has plans by R. H. Bierman, 3402 West Thurston Ave., Milwaukee, for a 130 x 150-foot foundry and a one-story 100 x 100-foot plant and warehouse.

WHITEWATER, WIS.—Whitewater Mfg. Co. has plans by A. Kuenzi, 202 North Water St., Watertown, Wis., for a one-story 71 x 148-foot plant addition.

PRECISION REID SURFACE GRINDERS

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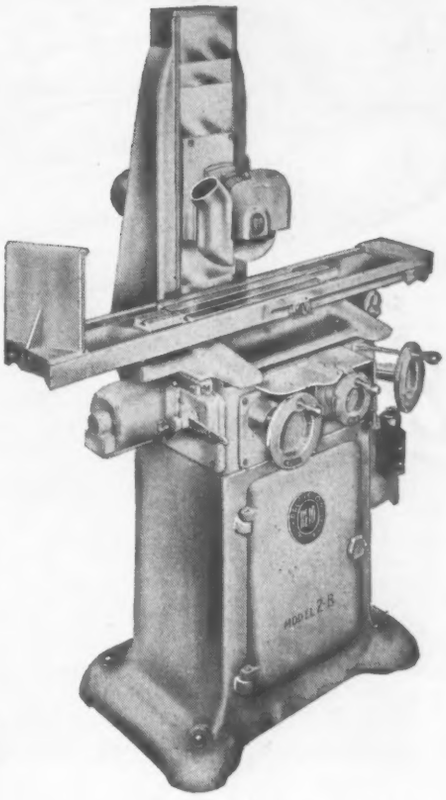

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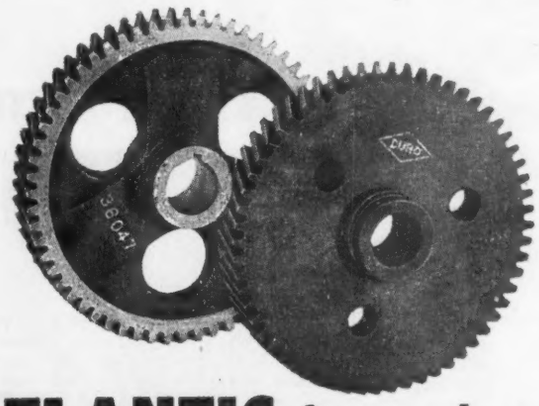

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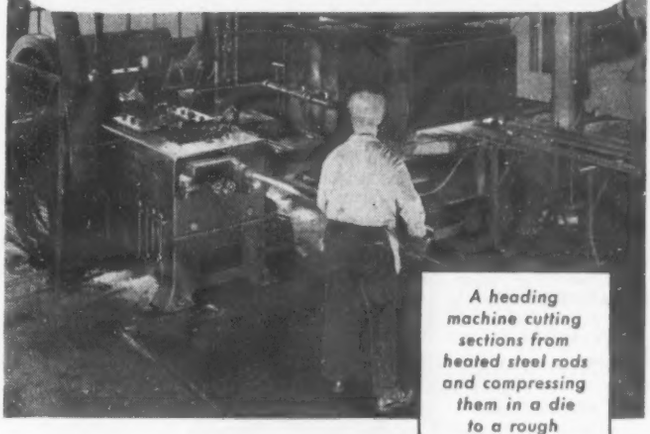

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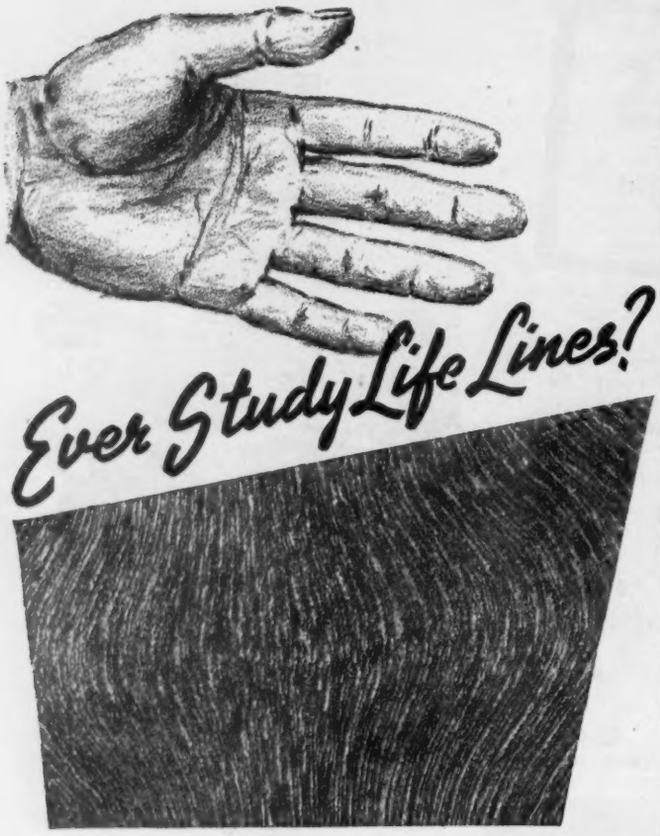

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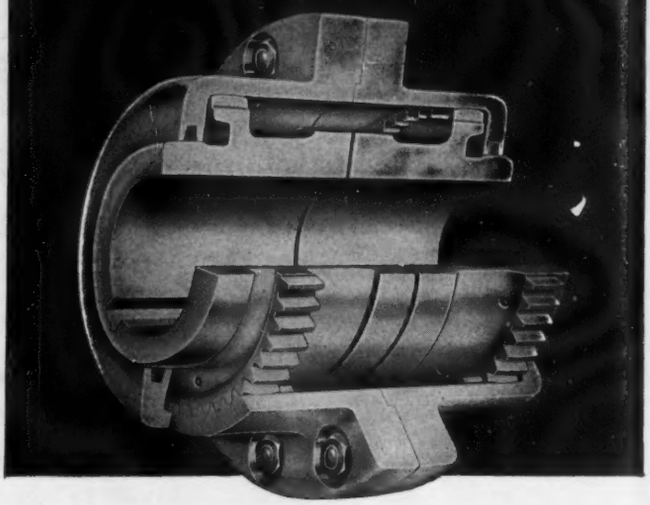

A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

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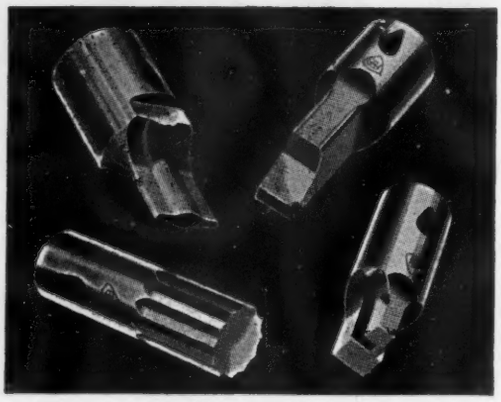

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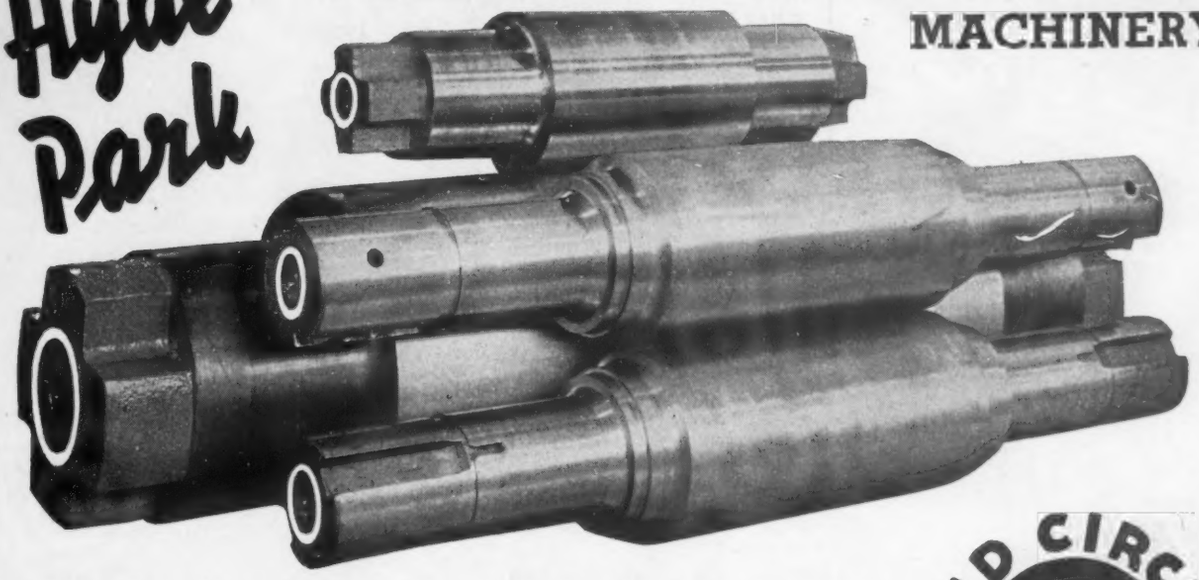

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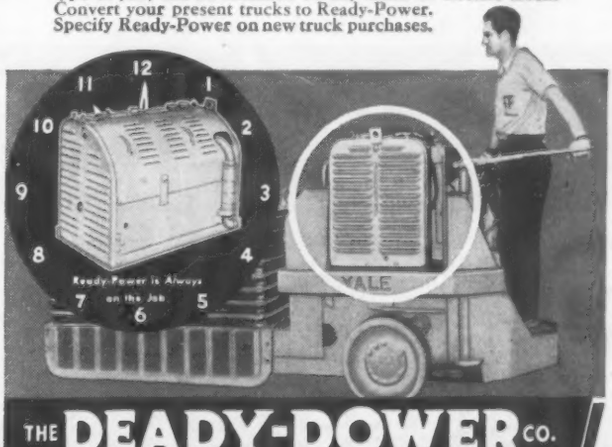


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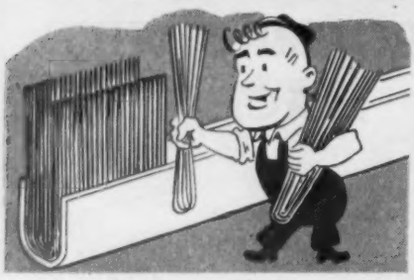

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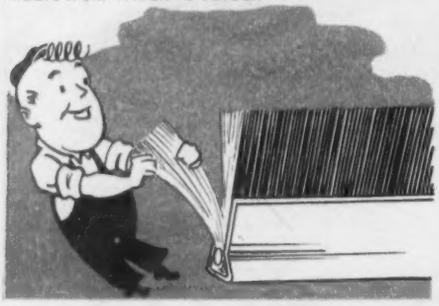

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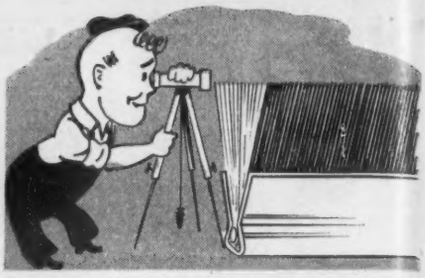
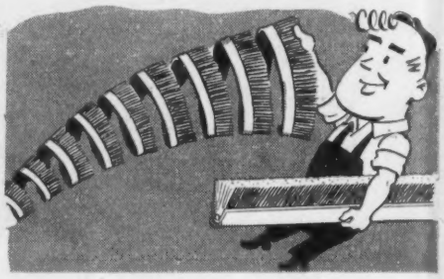


Correct and uniform length of brush material and a gapless, unbroken formation of uniform density throughout the length of the strip assure uniform brushing action.



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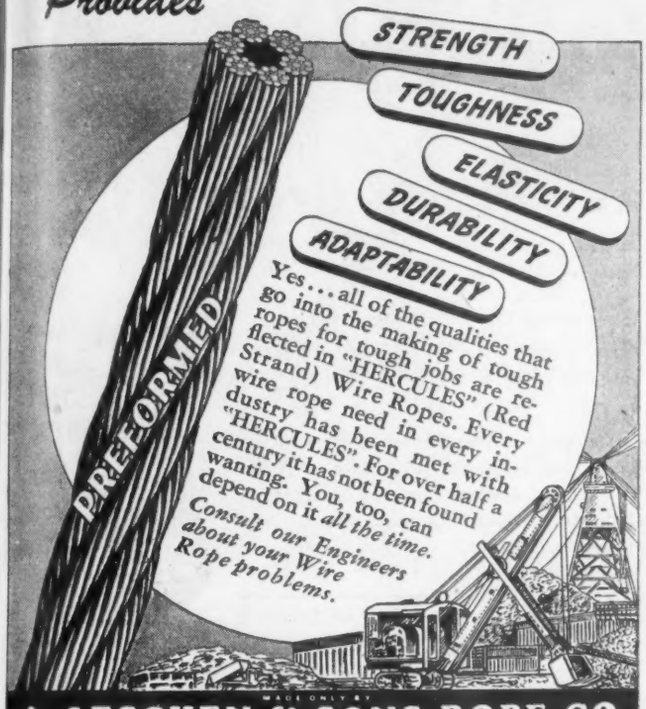
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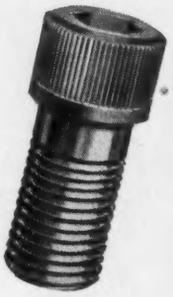

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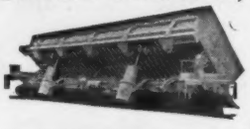

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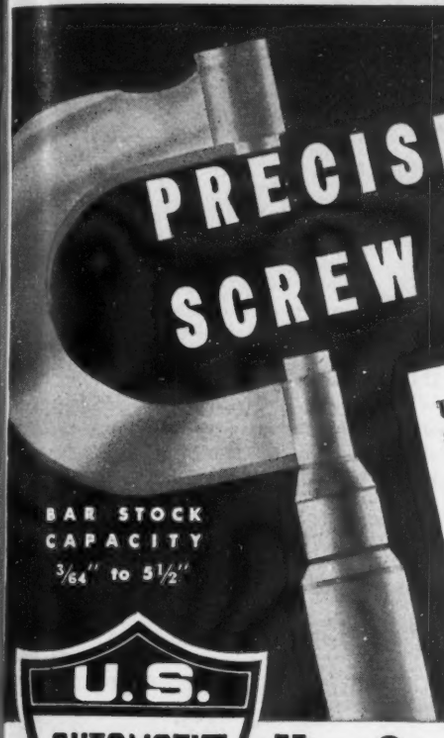


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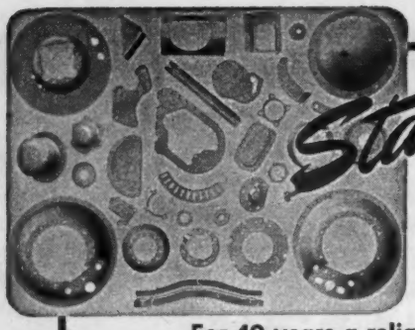

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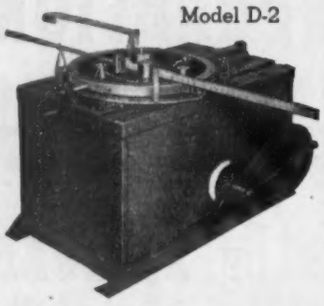
Model D-2



The Model D-2 Kardong Bender is a Four Direction Horizontal bender. With this bender when bending large bars it is not necessary to turn bars over to make reverse or second bends or 180 degree hook bends. The Model D-2 is equipped to bend bars around collars from 2 inch to 6 inch in diameter. Also made to bend up to 8 inch in diameter. Capacity of Model D-2 1¼ inch Square Bars. The Model D-2 is a production bender for concrete reinforcing steel for shop or fabricating plant. Ask for our catalog of our complete line of reinforcing bar benders.

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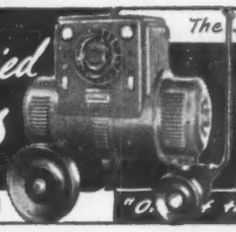

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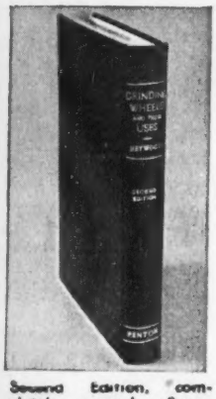

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Wheel Shapes and Sizes
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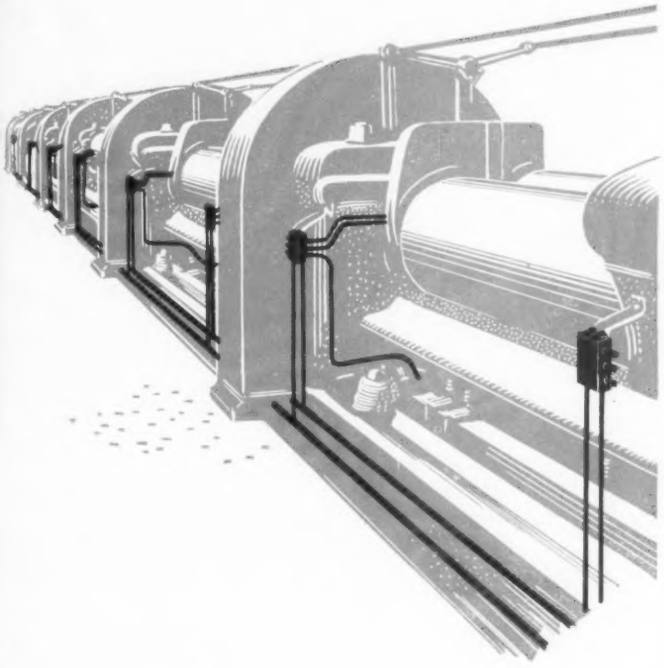
# Savings of $1910 a month

## from $7500 invested in Farval

FARVAL—*Studies in Centralized Lubrication No. 83*



FOR 12 years, one of the large rubber companies has been enjoying the satisfaction and economy of Farval centralized lubrication on its 46 rubber mills. Formerly, bearings were lubricated with heavy cylinder oil through sight-feed cups. This work, done by hand, took eight oilers and cost $1400 a month. Farval now does the job for $400 a month. The eight oilers were cut to two, who also keep the Farval systems filled and operating around the clock.

The money savings in labor and lubricant average $1910 a month. Yet gratifying as these dollar savings are, this user says the elimination of the former mill delays due to hot bearings has given the company an even larger return in increased mill output—far more valuable than all other economies combined. All this from an original investment in Farval centralized lubricating systems of less than $7500!

Farval delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, as often as desired. Farval —the Dualine System with the Positive Piston Displacement Valve—that has but 2 Moving Parts—is Fully Adjustable—and with a Tell-tale indicator at each bearing to show the job is done.

Savings comparable to the above can be made on your equipment with Farval. Write for Bulletin 25. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

*Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.*

FARVAL

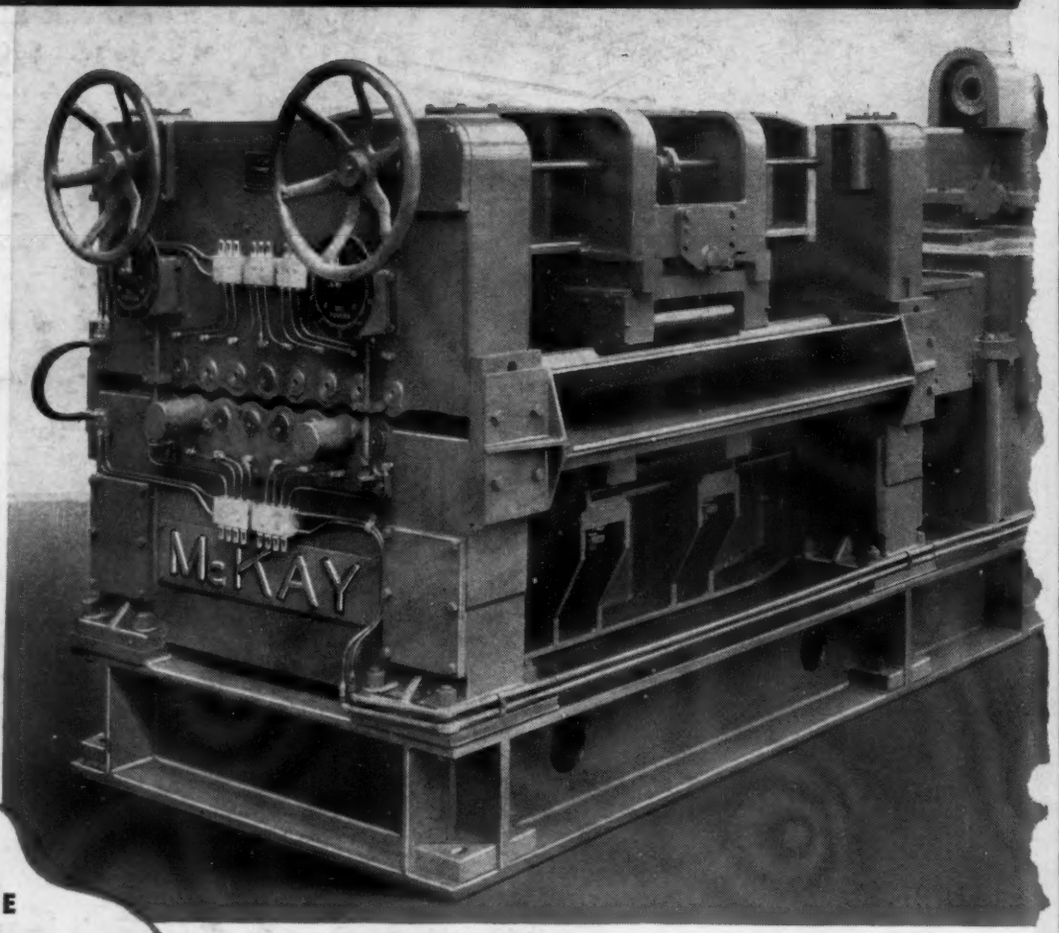
CENTRALIZED SYSTEMS OF LUBRICATION

# McKAY

## BACKED-UP ROLLER LEVELER

### FEATURES

- Compact design reduces required floor space.
- All adjustments are readily accessible to the operator.
- Accurate indicating dials are provided for the screwdowns.
- Alloy steel Helical gears are used throughout—fully enclosed and running in oil.
- Drive is through Universal couplings.
- One-shot lubrication system (Optional.)
- Rugged construction insures continuous performance and low maintenance cost.

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**PRECISION &**
**SAFETY**

THE McKAY Backed-Up Roller Leveling Machine has extraordinary rigidity because its small diameter work rolls are supported by backing-up rolls. This type of leveling works the sheet more thoroughly.

Sheets processed on this type of leveler are strain relieved to a greater extent and have far superior stamping and drawing qualities than those processed by the ordinary leveler.

*The* **McKAY MACHINE** *Company*

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